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THE IMPACT OF INTERPERSONAL AND COMMUNITY LEVEL INDICATORS ON MENSTRUAL HEALTH AND HYGIENE MANAGEMENT AMONG ADOLESCENT GIRLS IN RURAL INDIA: A METHODOLOGICAL ANALYSIS OF BEHAVIORAL MONITORING TOOLS

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ABSTRACT

United Nations Children's Fund (UNICEF) India is currently implementing "A Communication Framework: Menstrual Management" in Uttar Pradesh, Bihar, and Jharkhand, India. Behavioral monitoring of the communication framework allowed for the use of innovative community-based participatory monitoring tools to measure individual and community-level menstrual health and hygiene knowledge, attitude, and behavior change in villages receiving the menstrual management communication campaign. Behavioral monitoring tools were tailored for six populations, including adolescent girls, peer educators, mothers, fathers, frontline workers, and field facilitators. Mixed method approaches were used to analyze two innovative tools to assess their strengths and weaknesses while exploring social networks of adolescent girls and perceived social norms among respondent groups. Two manuscripts were developed to disseminate study findings: 1) Don't let a period end a sentence, let it start a conversation! A Mixed Method Approach to Exploring Adolescent Girls' Social Networks and Menstrual Health in Rural India and 2) "*Today's girls don't believe old ideas"*: The relationship between approval and menstrual health behaviors among adolescent girls in rural India.

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INTRODUCTION

The Dornsife School of Public Health has been appointed to provide technical expertise to UNICEF India to carry out behavioral monitoring of the Menstrual Health Communication Framework in Uttar Pradesh, Bihar, and Jharkhand from 2015- 2017. With particular emphasis on creating a participatory and empowering monitoring process, a mixed methods approach to data collection was designed and implemented in October 2015. This thesis explores the use of unique community-based participatory research (CBPR) behavioral monitoring tools and describes the impact of interpersonal and community level indicators on menstrual health knowledge, attitudes, and behaviors among adolescent girls in rural India.

MENSTRUAL HEALTH AS A PUBLIC HEALTH PRIORITY

Menstrual health and hygiene management (MHHM) is an emerging public health matter commanding the attention of academics, activists, feminine hygiene companies, and the United Nations alike to raise awareness and destigmatize the experience of menstruation for all adolescent girls and women around the world (Sommer, Hirsch, Nathanson, & Parker, 2015). The onset of menstruation not only signals the beginning of adolescence but it is a normal part of every healthy young woman's life (UNICEF, 2015). But unless she is able to manage her menstruation hygienically and free of shame, it can signal profound embarrassment, fear, and a loss of dignity.

The public health community defines MHHM as the "use of clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required and having access to facilities to dispose of used menstrual management materials" (Sommer & Sahin, 2013). However, around the world and across cultures, women and girls have developed their own strategies to manage their menstruation given their unique personal, social, and cultural contexts. Depending on the availability of resources, socio-economic status, education, cultural beliefs, local tradition, and personal preference, these strategies vary greatly between regions, countries, and even within communities (Sumpter & Torondel, 2013). And, given the complexity of these variables often women and girls in resource-limited contexts do not have access to the hygienic resources required for adequate MHHM leaving them vulnerable to disease, gender inequality, and social exclusion (Sumpter & Torondel, 2013; UNICEF, 2015).

Increasing efforts to improve menstrual health are important first steps in advancing global health agendas (Sommer, Sutherland, & Chandra-Mouli, 2015). Addressing menstrual health as an upstream form of primary health prevention tackles not only issues of adolescent and reproductive health, but will improve water sanitation and hygiene (WASH), gender

equality, nutrition, and education outcomes at the community level (Mahon & Fernandes, 2010; Sommer & Sahin, 2013; Sumpter & Torondel, 2013). Interventions that prioritize the indicators of adequate menstrual heath and the elimination of social stigma reinforcing restrictions and taboos adolescent girls face after menarche, particularly in resource limited settings, can inadvertently address multiple global development goals.

MENSTRUATION IN THE INDIAN CONTEXT

India is a country of 1.3 billion people, making it the second most populous country in the world (World Health Organization [WHO], 2016). Found in South Asia, India is bound by the Indian Ocean to the south and sharing land borders with Pakistan, China, Nepal, Bhutan, Myanmar, and Bangladesh. Despite being one of the world's fastest growing major economies, the country faces great public health challenges due to poverty and inadequate public heath infrastructure, most notable in rural states (WHO, 2016)

Menstruation is traditionally thought of as a polluting factor by many of religion, and in many communities in rural India women and adolescent girls are thought to be unclean or untouchable during menstruation (Garg, Goyal, & Gupta, 2012; Kansal, Singh, & Kumar, 2016; Kirk & Sommer, 2006; Mahon & Fernandes, 2010). In Hinduism, this misconception stems from a common belief that women are ritually impure and that menstrual blood is expelled from the body as a form of purification. These fallacies have resulted in the stigmatization of the topic and strict socio-cultural restrictions are placed on adolescent girls after attaining menarche, which result in gender inequality and poor menstrual health (Juyal, Kandpal, Semwal, 2013; Garg, Goyal, & Gupta, 2012; Shankaraiah, Haveri, Mallappa, & Saheb, 2013).

Negligible Communication

The stigma surrounding menstruation reinforces a culture of silence regarding menstruation in India and has left adolescent girls ill prepared to manage their menstruation. A review of literature in diverse Indian contexts indicates that as low as 8% of adolescent girls have even heard about menstruation before attaining menarche (Bhattacherjee, Biswas, & Chakraborty, 2013; Kavita, 2012; Khanna, 2015; Shridevi, Padma, 2013; Thakre, Thakre, Reddy, Rathi, Pathank, & Ughade, 2011). And while research indicates that girls turn to their mothers first regarding menstrual health, they too lack adequate knowledge on MHHM to provide their daughters, further contributing to inadequate menstrual management behaviors of adolescent girls (Clothe, et al., 2014).

Poor Knowledge

Given little awareness of menstruation among adolescent girls and women, knowledge regarding the physiological process of menstruation was measured during the formative

stages of UNICEF's Menstrual Management Framework (UNICEF, 2015). Results showed that 89% of adolescent girls in Uttar Pradesh, 76% in Jharkhand, and 72% in Bihar did not know menstrual blood came from the shedding of the endometrium and up to 86% of girls felt completely unprepared for menarche.

Socio-cultural Taboos and Restrictions

Limited knowledge contributes to prevailing myths and misconceptions regarding menstruation, sustaining socio-cultural restrictions placed on adolescent girls. Restrictions faced by adolescent girls during menstruation include dietary, mobility, and religious restrictions (Kumar & Srivastava, 2011). Dietary restrictions include avoiding sour foods, cooking, or even entering the kitchen (Dasgupta & Sarkar, 2008; Farage, Miller, & Davis, 2011). Mobility restrictions exclude menstruating girls from social functions, weddings, and celebrations (Farage, Miller, & Davis, 2011). Religious restrictions include not entering the religious places both at home and in the community, or participating in religious sacraments including prayer. Studies indicate religious restrictions have strict adherence; up to 70.6% of girls do not attend religious functions during menstruation (Dasgupta & Sarkar, 2008). Without doubt, menstruation related restrictions play a significant role in the daily lives of adolescent girls. Interestingly, a study among adolescent girls and mothers in Jharkhand found that 76.9% of respondents abide by these restrictions simply because they were told to do so, even though they were unable to explain the purpose of restrictions (Kumar & Srivastava, 2011).

Absorbent Use

Given the high price and relative inaccessibility of sanitary napkins in rural India, adolescent girls prefer to use and reuse cloth during menstruation as it is both economical and easily available (UNICEF, 2015). Because cloth is the preferred method of menstrual management, hygiene is a critical health behavior. Most girls are able to wash their used cloth with soap and water, however due to social stigma, embarrassment, and shame girls will likely not dry their clean cloth in the sun, a process that eliminates bacterial growth (UNICEF, 2015). Formative research for UNICEF's Menstrual Management Framework showed that up to 90% of adolescent girls were unaware of the importance of washing menstrual cloth with soap and drying it in the sun to kill germs and protect them from reproductive tract infections.

COMMUNICATION FRAMEWORK FOR MENSTRUAL MANAGEMENT

UNICEF India recognizes the state of menstrual health in rural India to be a fundamental health issue and an integral part of the lives of adolescent girls and women. Understanding that menstruation is shrouded in misconceptions, UNICEF developed a community-level communication framework to break the silence around menstruation and provide correct knowledge to promote the use of proper MHHM behaviors in Bihar, Jharkhand and Uttar Pradesh, India. *Figure 1* highlights the three-state region UNICEF is currently implementing the Communication Framework for Menstrual Management.

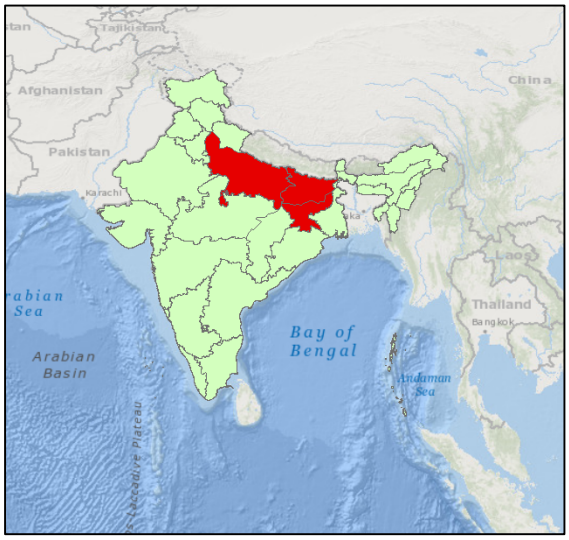


Figure 1. Region of Project Implementation

The Menstrual Management Framework intends to first break the culture of silence around menstruation by making sure adolescent girls, mothers, and other community members are comfortable talking about menstruation before improving their knowledge, attitudes, perceptions, and social norms related to adequate MHHM behavior (UNICEF, 2015). Using interpersonal communication, capacity building, community dialogue, and mass media to engage different audiences, this framework plans to advance MHHM at the individual and community level.

Monthly Adolescent Girls Group (AGG) meetings is the core communication activity of the campaign (UNICEF, 2015). These meetings are with 15-20 adolescent girls and led by trusted peer educators with the support of village level Accredited Social Health Activists (ASHAs) and Anganwadi Workers (AWWs) at the village level. Materials used during these meetings include activities from the Life Skills Based Module on menstrual management which help girls develop communication and negotiation skills regarding MHHM elements and challenge social norms and restrictions (UNICEF, 2015). The Paheli Ki Saheli Communication

package is used during meetings and includes entertainment-education films, an illustrated story based flipbook, a personal diary, and an interactive apron for peer educators and frontline workers to visually explain the physiology of menstruation. In addition, there are five interpersonal communication videos developed based on the Ammaji Kehti Hain series to address menstrual health related issues (UNICEF, 2015).

While AGG meetings are the keystone to the communication campaign, the campaign plans for monthly Mother's Group meetings to enhance mothers' knowledge about menstruation given that mothers are reported to be key influencers of adolescent girls' MHHM. Additionally, capacity building of community health workers, teachers, and peer educators is intended to improve community-level interpersonal communication to increase awareness about correct MHHM knowledge and behavior.

Theoretical Foundation

The Menstrual Management Framework relies on theories and models of behavior change to understand and justify intervention components. The two models used to individual and community-level behavior change and adoption are the Stages of Change Theory and the Socio-Ecological Model (UNICEF, 2015).

The Stages of Change Theory describes an individual's readiness for change based on a five-stage continuum and informs how the communication framework progresses individuals through a series of stages (Norcross, Krebs, & Prochaska, 2010; UNICEF, 2015). The five stages include pre-contemplation, contemplation, preparation, action, and maintenance. In the pre-contemplation phase participant groups have not yet thought about changing their behavior and because they are either unaware of the problem or are ashamed to discuss it. Breaking the silence regarding menstruation is used to move participants from pre-contemplation to the contemplation phase (UNCEF, 2015). In the contemplation phase, participants are willing to discuss and learn about menstruation and consider putting knowledge into practice. During preparation, communication messages target social norms and restrictions while promoting self-efficacy of participants to initiate action (UNICEF, 2015). During the action phase, participants adopt MHHM behaviors and over time with regular MHHM behavior communities will enter the maintenance phase and sustain changes.

The Socio-Ecological Model highlights the importance of societal level change and moves the focus past the individual and includes interpersonal, societal, and institutional influences as contributors to health behavior (McLeroy, Bibeau, Steckler, & Glanz, 1988). While change at the individual level will improve knowledge and behavior, effective and long-lasting change is enabled by the socio-ecological framework (UNICEF, 2015). Involving various social levels is necessary to create sustainable change, particularly in regard to the deeply rooted social norms around menstruation.

BEHAVIORAL MONITORING

In the context of public health, evidence-based program design and implementation is a critical element in achieving intervention attributable social and behavioral health outcomes. Understanding individual and community level change through process and outcome evaluation allows programs to revise activities in addition to informing future program implementation strategies. Monitoring is the ongoing, systematic, and routine collection of programmatic information for the purpose of improving practices and making informed decisions for future interventions (International Platform on Sport & Development, n.d.).

While traditional monitoring activities strictly measure project inputs and outputs in relation to intervention activities, a behavioral monitoring framework allows for the measurement of initial program outcomes (behavior change) throughout implementation. Behavioral monitoring for this project focuses on the both direct (MHHM behaviors) and in-direct (nutrition, education, and dialogue) effects of the communication campaign. *Figure 2* describes the domains and variables measured through the use of participatory behavioral monitoring tools.

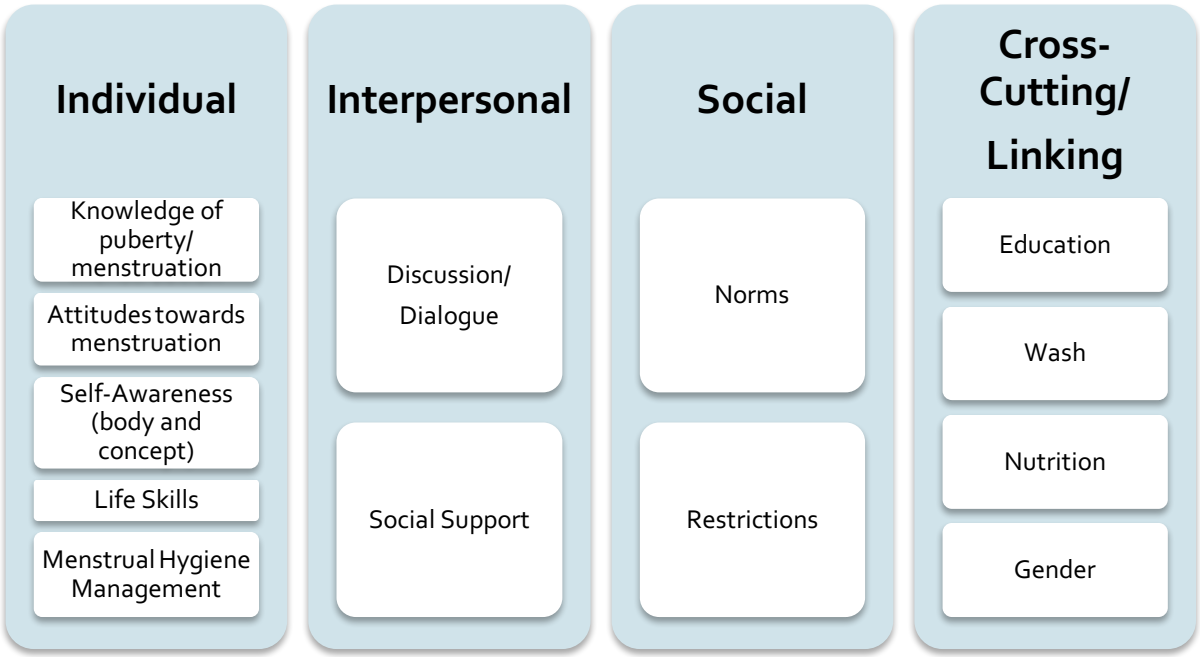


Figure 2. Domains and Variables for Behavioral Monitoring

Participatory behavioral monitoring is still a new and innovative approach to program evaluation, and while it has many assets, its participatory nature requires methodological analysis to understand particular strengths and weakness associated with various measurement tools. Projected strengths of behavioral monitoring include the ability to track

behavior over time while empowering participants and describing processes of change. Potential weaknesses of behavioral monitoring include the time associated with data collection and analysis. If the data provided through participatory behavioral monitoring approaches does not provide richer more robust understanding of reality, traditional approaches may be more advantageous.

In summary, participatory behavioral monitoring is a way of measuring initial program outcomes systematically over the course of an intervention. The practice provides evidence for behavior change concurrently with the intervention and further describes processes of change, traditionally only measured during outcome evaluation. This community-based master's project explores the use of two innovative participatory behavioral monitoring tools, Social Network Mapping and 2x2 Tables for Social Norms, used to measure the interpersonal and social domains of the intervention. Understanding both the interpersonal and community level indicators of MHHM as well as the efficacy of participatory behavioral monitoring tools will inform future design and implementation of monitoring and evaluation plans.

CBMP RESEARCH QUESTIONS

The purpose of this community-based master's project is to identify the impact of interpersonal and community level indicators on MHHM among adolescent girls in rural India. Thus, this project requires the analyses of behavioral monitoring tools including (1) Social Network Mapping and (2) 2x2 Tables for Social Norms as asked in structured interviews and focus group discussions. Listed below are the two research questions and aims for each of the two project components.

Research Question 1: To what extent does the use of social network mapping to explore communication of adolescent girls in rural India regarding menstrual health describe relationships between interpersonal communication and MHHM knowledge and behavior?

- **Aim 1:** To explore interpersonal communication trends on social network maps created by adolescent girls in focus group discussion and structured interviews.
- **Aim 2:** To identify trends in menstrual health discussion topics revealed by adolescent girls in focus group discussions at family, peer, and community levels.
- **Aim 3:** To determine relationships between interpersonal communication and MHHM knowledge, attitudes, and behavior among adolescent girls.
- **Aim 4:** To identify strengths and weakness of data collection methods and make recommendations for future use social network mapping.

Research Question 2: To what extent do perceived individual and community approval of social norms, restrictions, and taboos related to menstruation will predict adolescent girls' behavior in rural India?

- **Aim 1:** To explore the extent to which adolescent girls, their parents, and community members approve of social norms, restrictions, and taboos regarding menstruation.
- **Aim 2:** To examine the relationship between perceived approval and behavior related to social norms, restrictions, and taboos related to menstruation.
- **Aim 3:** To identify reasons, rewards, and sanctions adolescent girls, their parents, and community members associate with social norms, restrictions, and taboos regarding menstruation.

MANUSCRIPT 1: SOCIAL NETWORK MAPPING

Don't let a period end a sentence, let it start a conversation! A Mixed Method Approach to Exploring Adolescent Girls' Social Networks and Menstrual Health in Rural India

Abstract

Background: Adolescence is an exciting time for young people around the world, however, a culture of silence around menstruation in India leaves adolescent girls ill-equipped to manage menstruation hygienically, making them vulnerable to disease, gender inequality, and social exclusion. Social network theory explains that social interactions can impact individual's knowledge, attitudes, and behaviors. This study identifies who adolescent girls talk to about menstrual health and correlates their menstrual health behaviors with network contacts through the use of qualitative and quantitative data. Results from this study help inform best practices and strengthens interventions by analyzing qualitative and quantitative data to identify key influencers for menstrual health and hygiene management (MHHM) in rural India.

Methods: A community-based mixed-method study was conducted to assess social networks of adolescent girls in Bihar, Jharkhand, and Uttar Pradesh, as they relate to menstrual health. Post-menarche girls took part in structured interviews (n=1050) as well as focus group discussions (n=105). The same social network questions were asked in interviews as well as focus group discussions (FGDs) using social network mapping. Quantitative and qualitative methods were used to identify trends in social network structure, topics of discussion, and MHHM indicators. Additionally, strengths and weaknesses to each approach were examined in order to discern which of the two methods is most beneficial and thus, provide recommendations for future research.

Results: Interviews reveal that 99.8% of girls discuss MHHM at the family level, 97.7% at the peer level, and 88.4% at the community level. Interview participants reported that 85.5% of mothers were allies in communication, followed by field facilitators, school friends, and sisters. FGD corroborated these findings and revealed that at the family level girls have more discussions about MHHM behaviors than at the peer or community levels. The correlation of social network structure and MHHM knowledge and behavior from structured interview data showed mothers and community health workers to be key network influencers for adequate MHHM.

Conclusion: Interpersonal communication about menstruation with female family members and community health workers has positive MHHM outcomes on adolescent girls in rural India. This study demonstrates that the use of participatory research tools, such as social network mapping, provides a more comprehensive and descriptive understanding of social network dynamics and dialogue surrounding MHHM. However, correlation of interpersonal communication with behaviors at the population level requires structured interviews.

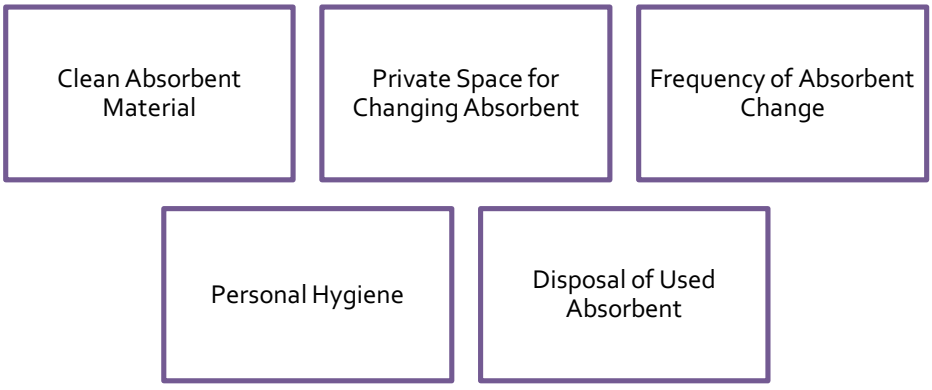
Background

Introduction

Adolescence is a time period accompanied by profound physical and psychological changes including menstruation, a physiological change experienced by all healthy young women around the word. However, not all girls are prepared for menstruation before attaining menarche. Menstruation is a sensitive topic in India, shrouded in socio-cultural significance and making the mere mention of menstruation not only a source of uncertainty, but also a source of great shame and embarrassment for adolescent girls and adults alike (UNICEF, 2015). The culture of silence around menstruation in rural India has reinforced the prevalent misconception that menstrual blood is 'dirty' and women are impure during menstruation (Garg, Goyal, & Gupta, 2012; Kansal, Singh, & Kumar, 2016; Kirk & Sommer, 2006; Mahon & Fernandes, 2010). The fallacy that women are ritually dangerous during menstruation, that their touch can spoil food, in addition to environmental and social processes, results in strict dietary, mobility, and religious restrictions preventing gender equity and adequate menstrual health and hygiene behaviors. Apart from feeling scared and embarrassed, adolescent girls are at increased risk for health conditions such as reproductive tract infections associated with poor menstrual health and hygiene management (UNICEF, 2015).

Menstrual health and hygiene management (MHHM) is the "use of clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required and having access to facilities to dispose of used menstrual management materials" (Sommer & Sahin, 2013). *Figure 1* below shows the requirements for adequate MHHM practice. One way to increase the use of these MHHM practices is through increased dialogue.

Figure 1. Adequate Menstrual Health and Hygiene Management Requirements



The need to increase dialogue about menstruation is evident in the literature, as previous studies across India indicate that as low as 8% of adolescent girls have even heard

about menstruation before attaining menarche (Bhattacherjee, Biswas, & Chakraborty, 2013; Kavita, 2012; Khanna, 2015; Shridevi, Padma, 2013; Thakre, Thakre, Reddy, Rathi, Pathank, & Ughade, 2011). And while research indicates that girls turn to their mothers first regarding menstrual health, mothers too lack adequate knowledge to provide their daughters in relation to MHHM (Clothe, et al, 2014). Increased interpersonal communication about menstruation has the potential to improve health behaviors associated with MHHM in adolescent girls (UNICEF, 2015). Therefore, determining how best to study interpersonal communication regarding MHHM is key to advancing local and global conversations about menstrual health.

Social Networks and Health Behavior

People are inherently social beings, and social interactions and relationships are known to impact individual health behaviors (Heaney & Viswanath, 2015). In public health, it is theorized that social networks provide social support, social influence, social engagement, person-to-person contact, and access to resources, all of which impact individual and community-level health outcomes (Smith & Christakis, 2008). Social interactions promote knowledge exchange and the diffusion of new ideas through means of interpersonal communication (Diez-Vial & Montoro-Sanchez, 2014). Thus, the tie an individual has to another person in their network provides opportunities to acquire, transfer, and create new knowledge (Diez-Vial & Montoro-Sanchez, 2014).

The study of social networks gained momentum in the early 1980s after Rogers and Kincaid (1981) investigated communication networks of Korean women from rural villages by asking them to indicate who they went to for advice about family planning. Through mapping social networks in regard to family planning, their analysis showed that an individual's decision to adopt family planning behavior was influenced by the percent of their network connections who also adopted the behavior (Rogers & Kincaid, 1981). Their study revealed that women who have positive opinion leaders in their social networks are more likely to use contraceptives. This example illustrates how social network mapping is used as a tool to investigate how people communicate with key individuals in their social environment about specific topics (Rogers & Kincaid, 1981).

Social networks are the social structures and relationships that surround an individual, group, or organization (University of Twente, 2010). The understanding of how individuals and groups interact with each other is known as 'social network theory' (Berkman, Glass, Brissette, & Seeman, 2000). Central to social network theory is that the structure of an individual's social network affects their beliefs, attitudes, and behaviors through causal pressure from within the network (University of Twente, 2010; Berkman, Glass, Brissette, & Seeman, 2000). The purpose of social network analysis is to measure the magnitude of these pressures (University of Twente, 2010). Because social networks are known to affect beliefs, attitudes, and support the diffusion of new ideas (University of Twente, 2010), social network mapping is used in this

study to investigate the social networks of adolescent girls and understand how menstrual health information flows throughout the community and affects behavior.

Social Network Mapping and Analysis

Social network mapping is a community-based participatory research (CBPR) tool used to understand participants' discussions and dialogue around a particular issue. Network maps are pre-structured, usually through the use of concentric circles or sectors (see *Figure 2*), instruments in which the participant answers questions regarding their social network by filling in the framework during a face-to-face individual interview or focus group discussion (FGD) (Gamper, Schönhuth, & Kronenwett, 2012). The social network analysis that accompanies these maps allows for the measurement of an individual's interpersonal relationships, including family, peer, and community members (Smith & Christakis, 2008; Valente, 2015). This provides comprehensive data of social communities, settings, and systems, while offering a visual display of complex system data that is easily presented by respondents and interpreted by researchers (Valente, 2015).

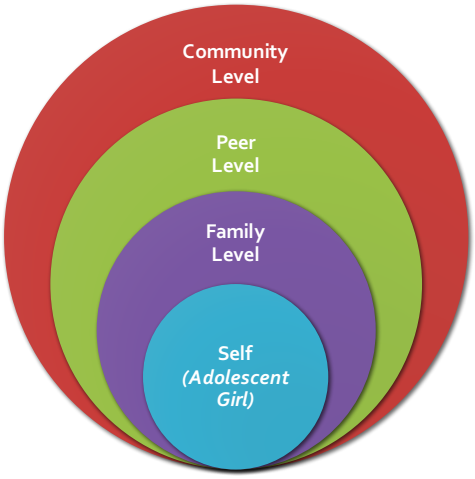


Figure 2. Social Network Map

There are many benefits to using visualization techniques to gather network data. It provides a depiction of a complex system easily interpreted by the interviewer and it can be visibly retained for the duration of the interview (Straus, 2002). Additionally, visualization allows for participatory interviews, in which the interviewee and researcher can develop and discuss the network map together while still allowing for the standardization of interviews (Gamper, Schönhuth, Kronenwett, 2012). This process also works in FGDs, often used when the researcher is studying the collective view of a community or merging individuals' networks together for a joint display (Gamper, Schönhuth, Kronenwett, 2012).

Using Social Networks to Study MHHM Communication

Social networks can be studied through both quantitative and qualitative data collection methods. Quantitative social network analysis focuses on the formal structure of the network, such as the individual contacts and types of relationships (Gamper, Schönhuth, & Kronenwett, 2012) while the use of quantitative research methods provides data that can easily be compared across respondent groups. The use of qualitative research methods is increasing in social network analysis to explore subjective perceptions of network contacts (Gamper, Schönhuth, & Kronenwett, 2012). Qualitative research methods allow researchers to

gather data through narratives, providing a wider scope in which to grasp social network dynamics (Gamper, Schönhuth, & Kronenwett, 2012).

This manuscript uses data from a cross-sectional mixed-methods study with adolescent girls from seven districts across three states in rural India designed to examine key individuals as environmental factors that influence MHHM behaviors. The study used a qualitative arm which included participatory social network mapping and a quantitative arm involving structured interviews and questions about social networks. This study has four research questions (RQs):

RQ 1: What are the interpersonal communication trends of adolescent girls between social network maps and structured interviews?

RQ 2: What are the trends in MHHM discussion topics at family, peer, and community levels?

RQ 3: What correlations exist between interpersonal communication and MHHM knowledge and behaviors among adolescent girls?

RQ 4: What are the strengths and weaknesses of structured interview and social network mapping methods to make recommendations for future use of social network mapping?

Methods

The social network data is part of a larger mixed methods study conducted to examine the effectiveness of a community based communication intervention across three states of India: Uttar Pradesh, Bihar, and Jharkhand. Using frontline workers and peer educators, the UNICEF Communication Framework for Menstrual Management engages adolescent girls, mothers, fathers, and community members in a multi-media communication package about the importance of MHHM. Monthly meetings provide adolescent girls the opportunity to engage with peers, breaking the silence many experience in relation to menstrual health. The social network data gathered during concurrent behavioral monitoring measures the interpersonal domain and variables related to discussion and dialogue regarding menstrual health.

The results reported in this paper are from structured interviews and FGDs among adolescent girls during Phase 1 of concurrent behavioral monitoring. Within Uttar Pradesh, 45 villages were chosen from the districts of Jaunpur, Mizapur, and Sonbhadra. In Bihar, 30 villages were chosen from the districts of Nalanda and Vaisahali. And in Jharkhand, 30 of village were chosen from the districts of Gumla and East Singhbum. Data collection occurred over 4 weeks in October of 2015.

Participants

Districts within the aforementioned states in India were selected purposively for monitoring if they were implementing UNICEF's Communication Framework for Menstrual

Management. Local NGO partners helped compile a complete list of intervention villages across all seven districts. Blocks were again purposively selected to have a representative sample of NGOs involved in program implementation. Random selection was eventually used to identify 15 villages from each district to make up the sample for this study.

Within each district, the structured interview sample included 150 adolescent girls (n=1050). The study sample for the FGDs consisted of 15 focus groups per district involving 8-12 post-menarche girls (n=105). Adolescent girls were selected for participation in FGDs based upon village-level Adolescent Girls Group meeting attendance rosters, a component of the communication framework and intervention. The girls were contacted at their residence and after obtaining parental consent and individual assent, adolescent girls were selected to take part in focus groups in each village. An additional 10 adolescent girls were selected based on availability for in-depth interviews in each village. Drexel University's Institutional Review Board provided approval for data collection.

Data Collection

Structured interviews. Trained interviewers, using a structured interview guide conducted interviews consisting of pre-coded and open response questions, including demographic data, information on menstruation related knowledge, attitudes, and practices, interpersonal communication, and social support related to menstruation. Structured interviews were translated from English into Hindi and administered one-on-one with each respondent. Interviews combined quantitative and qualitative questions, using both paper and tablets to record responses. Interviews took place in the respondent's village, where they lived and were recruited. Interviews were conducted at the respondent's home or a private place convenient for the respondent and took between sixty to ninety minutes to complete.

Focus group discussions. Trained facilitators, using CBPR tools, facilitated FGDs. The FGDs consisted of four data collection activities, of which social network mapping was one, tailored for adolescent girls and lasted approximately two hours. Each activity was translated from English into Hindi. Facilitators participated in training prior to data collection to ensure systematic and efficient focus group facilitation. Each focus group included 8-12 adolescent girls. The discussions were held in a place convenient to the participants, within the same village the adolescent girls were recruited and lived.

Measures

Social network mapping was used to understand the way in which menstrual health communication moves throughout sample villages. Adolescent girls in both the interview and FGD samples were asked questions that elicited information about who they discuss menstruation with in their families, peer groups, and their entire community. The interviews and FGDs were designed to obtain the exact same information on social networks, however

using different methods. The specific measurement tools used can be seen in Appendix A: Data Collection Tools for Social Network Analyses.

Structured interviews. The structured interview guide included seven sections. For the purposes of this manuscript, only questions from the Social Network Mapping and Menstruation sections of the interview were analyzed. Questions regarding interpersonal communication were used to understand person-to-person communication about menstruation. During the interviews respondents were shown a social network map photo cue (see Figure 2) and were asked to identify who they talk to in their family, peer groups, and community about menstruation. They were asked to identify allies (those who they feel comfortable talking) and barriers (who they feel uncomfortable talking) to communication regarding menstruation. Then they were asked who they would turn to first to talk about menstruation and who they would turn to if that person was not available.

The structured interviews included questions related to MHHM behaviors. These questions were analyzed in relation to adolescent girls' social network structure. Questions were open-ended and included:

"*What type of menstruation absorbent do you use?*"
"*How do you dispose of your used absorbent?*"
"*How do you manage pain and discomfort during menstruation?*"
"*How do you store your absorbent?*"
"*Can you show me on this picture where menstrual blood originates from?*"

Focus group discussions. FGDs were designed using CBPR principles, tailoring innovative data collection activities for adolescent girls. The interactive tool used in this study is called Social Network Mapping, which requires adolescent girls as a group to collaborate and create a social network map depicting who they talk to about menstruation at various social levels: family, peer, and community. The question posed was "*Who do you talk to about menstruation?*" Trained facilitators used probing questions as the adolescent girls discussed who they would include on their social network map as seen in Figure 2. On a large sheet of white paper, the girls wrote on the map all their network contacts.

In addition, adolescent girls revealed the topics of discussion they have within the various levels of their social network map. They were asked, "*What do you talk about?*" and filled in detailed discussion topics in the corresponding circle on their social network map. Adolescent girls were then asked to distinguish between allies and barriers to communication regarding menstruation. They used green (allies) and red (barriers) markers to label and distinguish between the two groups. Then they were asked to collectively decide who they would turn to first to talk about menstruation and who they would turn to if that person is not available.

Data Analysis

Interviews and FGDs were analyzed separately to understand the value of the independent methodologies, addressing RQ1 and 2. Results were then analyzed together to answer RQ3, which explores how social networks influence MHHM behaviors. To address, RQ4, FGD and structured interviews results were compared to understand strengths and weaknesses of data collection methods and make recommendations for future use of social network mapping.

Structured interviews. Data gathered from the in-depth interviews were translated into English and entered into Stata 14.1 for analysis. Univariate analyses included basic frequencies, percentages, and means. Analyses were conducted to examine socio-demographics of the participants, as well as who respondents talk to about menstruation, who they turn to first and second, and who they identify as allies and barriers to communication.

Bivariate analyses included Chi-square significance testing reporting the Pearson Correlation. Significant correlations between prominent social network members and MHHM knowledge and behaviors was determined at $p<0.05$.

Quantitative structured interview analyses were used to determine interpersonal communication trends of adolescent girls (RQ1) and what correlations exist between interpersonal communication and MHHM knowledge and behaviors among adolescent girls (RQ3).

Focus Group Discussions. Following each FGD, data collected on the social network maps were translated into English, coded, and entered into Stata 14.1 for analysis. Data analysis began with the development of primary and secondary codes to categorize who participants reported talking to and the reported topics of discussion about menstrual health. Conservative coding and crosschecking procedures were used to verify the focus group content. These codes were then analyzed for recurrent themes and descriptive statistics were used to understand trends across FGDs. Items coded included individuals at each level, and who the adolescent girls turn to first and second to talk about menstrual health.

FGD participants revealed topics of discussion regarding menstrual health at each level of their social network map. These topics were translated into English and coded, using a total of 136 codes. *Table 1* explains and provides an example of the coding scheme used for analysis of discussion topics. Using the definition of MHHM as the domain for measurement, only codes related to behaviors and restrictions were collapsed to generate seven umbrella codes that encompass discussions relevant to menstrual health behavior. Focus group qualitative analyses were used to determine interpersonal communication trends of adolescent girls (RQ1) and what trends in MHHM discussion topics are apparent at the family, peer, and community levels (RQ2).

Table 1. Social Network Mapping Qualitative Coding Scheme

Social Network Mapping- Topics of Discussion Coding Scheme		
Domain	**Code**	***Example***
Menstrual Hygiene Management	1-Clean Absorbent	*Store absorbent like you would a friend, in a clean/safe space*
		Drying menstrual cloths in sun
		Wash menstrual cloths with soap/nirma
	2-Procurement of Absorbent	*Discussion about where to get absorbents*
		Procure cloth from teacher
		Procure cloth from mother/sister
	3-Private Space for Changing	*Discussion about toilet/private space/enclosure*
		Convince family to construct toilet/private space
		Sensitize about importance of toilets
	4-Absorbent Change Frequency	*When to change cloth/pad*
		Change absorbent 2-3 times everyday
		Change absorbent 3-4 times everyday
	5-Personal Hygiene during Menstruation	*Bathe everyday with soap during menstruation*
		Wash hands with soap before before/after changing absorbent
		Importance of cleanliness during menstruation
	6-Absorbent Disposal	*Burying/Burning used absorbents*
		Discussions on where to dispose absorbents
		Do not throw absorbents in ponds/river
	7-Restrictions	*Do not eat pickle/sour food during menstruation*
		If we can worship/enter a place of worship
		Do not believe old customs and restrictions

Results

The study findings are organized with the intent to compare results from the structured interviews with those of the FGD to highlight the benefits and limitations of each social network data collection approach (RQ4) while: describing salient trends in social network contacts of adolescent girls (RQ1), identifying meaningful discussion topics related to MHHM and different levels (RQ2), and showcasing significant correlations between key network contacts and adequate menstrual health knowledge and behaviors (RQ3).

Demographics

There were a total of 1050 adolescent girls interviewed who participated in the structured interview, representing equal proportions from all seven sample districts.

Respondents were between the ages of 13-17 years and on average were 15 years in age. The majority of participants identified as Hindu (94.4%) and were from other backward castes (41.4%). Eighty-six percent of girls reported currently being enrolled in school. The 105 FGDs were attended by 871 adolescent girls between the ages of 13-18 with a mean age of 15 years. *Table 2* details descriptive demographics from both the interview and focus group discussion samples.

Table 2. Participant Characteristics

Participant Sample Characteristics			
		Interview (%)	**FGD (%)**
Total		**1050**	**871**
Age (Years)	13	16.19	14.47
	14	24.19	25.26
	15	20.95	21.93
	16	20.67	17.68
	17	18.00	19.06
	18	0.00	1.61
Religion	Hindu	94.38	
	Muslim	4.67	
	Other	0.95	
Caste/Tribe	Other Backward Caste	41.43	
	Scheduled Caste	29.24	
	Schedule Caste	17.81	
	General Caste	11.52	
Marital Status	Unmarried	98.38	
	Married	1.62	
School Enrollment	Yes	86.76	
	No	13.05	

Adolescent Girls' Social Networks

Adolescent girls' social network structure was measured in both structured interviews and FGD social network mapping. The results of both of these methods suggest adolescent girls engage in discussions regarding menstruation at the family, peer, and community level. Results are depicted to the fullest extent possible and organized by level. At every level more individuals were described on FGD social network maps in comparison to individual structured interviews. A total of 34 networks contacts were identified using participatory social network methodologies while only 18 network contacts were included when adolescent girls were asked social network questions in individual interviews.

Family Level. At the family level, 99.8% of interview respondents and 100% of FGDs report talking to someone about menstruation. As depicted in *Table 3*, in both the interviews

and FGDs, mothers were the most prominent network contact. Mothers were described by 85.5% of interviews and 86.7% of FGDs as an ally to communication.

Table 3. Family Level Social Network Contacts

Family Level						
	Structured Interview (n=1050)			Participatory Mapping (n=105)		
Network Member	**Total**	**Allies**	**Barriers**	**Total**	**Allies**	**Barriers**
Mother	94.00	85.51	12.26	100.00	86.67	9.52
Sister	70.76	81.83	12.25	99.05	72.12	0.96
Younger Sister				16.19	70.59	23.53
Bhabhi	41.24	76.67	16.86	96.19	72.28	5.94
Aunt	45.81	39.29	42.82	__	__	__
Chachi	__	__	__	92.38	36.09	51.54
Bua	__	__	__	40.00	30.95	45.24
Mausi	__	__	__	20.00	38.10	52.38
Maami	__	__	__	16.19	52.94	41.18
Grandmother	15.14	28.93	57.23	52.38	30.91	58.18
Naani	__	__	__	5.71	50.00	33.33
Badi mummy	__	__	__	13.33	21.43	71.43
Father	1.05	0.00	100.00	7.62	0.00	75.00
Brother	__	__	__	3.81	0.00	100.00
Nobody	0.19	0.00	0.00	__	__	__

Sisters are the second most prominent network contact revealed by girls during interviews and FGDs and are considered allies to communication. In FGDs, 16.2% of maps disaggregated sister from younger sister providing a more robust understanding of social network dynamics than structured interviews. The same trend describes adolescent girls' connection to aunts regarding menstruation. In structured interviews 45.8% of adolescent girls described talking to aunts, however in FGDs the kind of aunt was thoroughly described as either their chachi (father's younger brother's wife), bua (father's sister), mausi (mother's sister), or maami (mother's brother's wife). The FGDs gives a more complex understanding of the kind of aunt adolescent girls talk to most, 92.4% of FGD reporting speaking to their chachi and only 16.9% to their maami. This gave a clearer understanding of who adolescent girls talk to about menstruation in comparison to the interviews.

Females at the family level are predominant in social networks of both the FGD maps and the individual interviews, however there was a variation in the inclusion of bhabhis (brother's wife) and grandmothers in the FGDs and interviews. Bhabhis are included on 96.2% of participatory social network maps, while only 41.2% of adolescent girls included her during interviews. This could be the result of participatory approaches. Unless adolescent girls have

an older married brother they would not have a bhabhi to include. However, in a FGD setting consensus is required so the likelihood of reporting about a bhabhi is greater, perhaps falsifying the prevalence of the network tie. Grandmothers are included in 52.4% of FGDs, with 5.7% of maps specifying the kind of grandmother by including naani (maternal grandmother), while only 15.1% of girls in the interviews included their grandmother. Despite these difference bhabhis and grandmothers are similarly considered allies by 76.7% and 28.9% of interview participants and 72.3% and 30.9% of FGD maps, respectively.

Peer Level. At the peer level 97.7% of interview respondents and 100% of the focus groups report talking to someone about menstruation. *Table 4* shows that among peer groups, school friends are the most predominant network contacts, with 77.9% of interview participants and 100% of FGDs including school friends. Of those mentioning school friends in interviews 81.4% considered them allies and 71.4% of the focus groups labeled them as so too. In addition to school friends, neighbors are included in 57.9% of interviews and 82.9% of FGDs.

Table 4. Peer Level Social Network Contacts

Peer Level						
	Structured Interview (n=1050)			Participatory Mapping (n=105)		
Network Member	**Total**	**Allies**	**Barriers**	**Total**	**Allies**	**Barriers**
School friends	77.90	81.42	16.26	100.00	71.43	18.10
Neighbors	57.90	68.75	27.96	82.86	77.01	16.09
AGG friends	40.86	73.89	15.85	30.48	78.13	3.13
Village friends	__	__	__	36.19	55.26	21.05
Tuition friends	5.71	60.00	36.67	34.29	55.56	38.89
Peer Educators	1.24	53.85	23.08	18.10	84.21	0.00
Friends from other villages	__	__	__	18.10	36.84	52.63
Friends of relatives	__	__	__	12.28	53.85	76.92
Nobody	2.29	0.00	0.00	__	__	__

The FGDs revealed more specific peer groups in comparison to the structured interviews. Included were village friends, friends from other villages, and friends of relatives who were not collapsed as "friends" in the interviews. Overall, peers are considered allies to communication regarding menstruation in both the FGDs and interviews despite variance in distribution. For example, school friends are mentioned by 77.9% of interviewed respondents and AGG friends are mentioned by 40.9%, but in both cases are considered allies to communication at 81.4% and 73.9% respectively. This trend is apparent in both the interview and FGD data.

In the FGD social network mapping, the frequency of network contacts mentioned increased in all cases except AGG friends. Participatory approaches allowed research participants to explore their social networks among peers perhaps contributing to increased discussion and agreement about who girls truly speak to about menstruation, providing the study with more descriptive data than using structured interviews.

Community Level. At the community level, 88.4% of interviewed adolescent girls and 100% of FGDs report social network contacts regarding menstruation. The most prevalent network members are community level health workers including, Anganwadi Workers (AWWs), Accredited Social Health Activists (ASHAs), and field facilitators of the UNICEF Menstrual Management program. The most predominant network contact is the field facilitator in the structured interviews mentioned by 66.1%, followed by AWWs (55.6%) and ASHAs (44.5%). However, in the FGD the most predominant network contact is the AWW, mentioned by 87.6% of respondents and followed by the ASHA (86.7%) and the field facilitator (74.3%). Overall, social network mapping showed higher percentages of community level network members than the individual interviews, seen in *Table 5.*

Table 5. Community Level Social Network Contacts

Community Level						
	Structured Interview (n=1050)			Participatory Mapping (n=105)		
Network Member	**Total**	**Allies**	**Barriers**	**Total**	**Allies**	**Barriers**
AWW	55.62	65.75	27.57	87.62	64.13	19.57
ASHA	44.48	63.60	30.41	86.67	61.54	18.68
Field Facilitator	66.10	90.06	6.77	74.29	82.05	5.13
Teacher	13.05	43.07	51.09	60.00	20.63	58.73
ANM	9.62	38.61	55.45	43.81	19.57	45.65
Doctor	1.43	46.67	40.0	14.29	20.00	46.67
AWW Sahayika	__	__	__	7.62	25.00	62.50
Females of the community	__	__	__	5.71	16.67	66.67
Sarpanch	__	__	__	5.71	16.67	66.67
NGO	__	__	__	4.76	0.00	80.00
Jalsahiya	__	__	__	1.90	0.00	100.00
Ward member	__	__	__	1.90	50.00	50.00
School helper/dai	__	__	__	1.90	0.00	50.00
Nobody	11.62	0.00	0.00	__	__	__

Interview and FGD data suggest the greatest ally to discussion related to menstruation at the community level is the field facilitator. Of the interviewed girls, 90.1% consider them an ally to communication and 82.1% of the FGD labeled them as such. In comparison to other

community level health workers, this indicates adolescent girls have the most comfortable relationships with field facilitators regarding the topic of menstruation.

Preferred Network Contacts Regarding Menstruation. Interview and FGD data corroborated findings regarding whom adolescent girls turn to first and second regarding menstruation, seen in *Table 6.* The majority of interviewed girls (71%) turn to their mothers first and 41.3% turn to their sisters second. In the FGDs, similar data was gathered with 83.8% of groups saying they reach out to their mothers first and their sisters second (43.8%).

Table 6. Key Social Network Contacts Adolescent Girls Prefer to Talk to About Menstruation

Social Network Contacts Adolescent Girls Turn To 1st and 2nd Regarding Menstruation				
Individual Mentioned	**Structured Interview (%)**		**Participatory Mapping (%)**	
Turn to:	*1st*	*2nd*	*1st*	*2nd*
Mother	71.0	14.8	83.8	4.8
Sister	17.3	41.3	4.8	43.8
Aunt	9.1	26.6	0.0	6.7
Bhabhi (brother's wife)	0.0	0.5	9.5	12.4

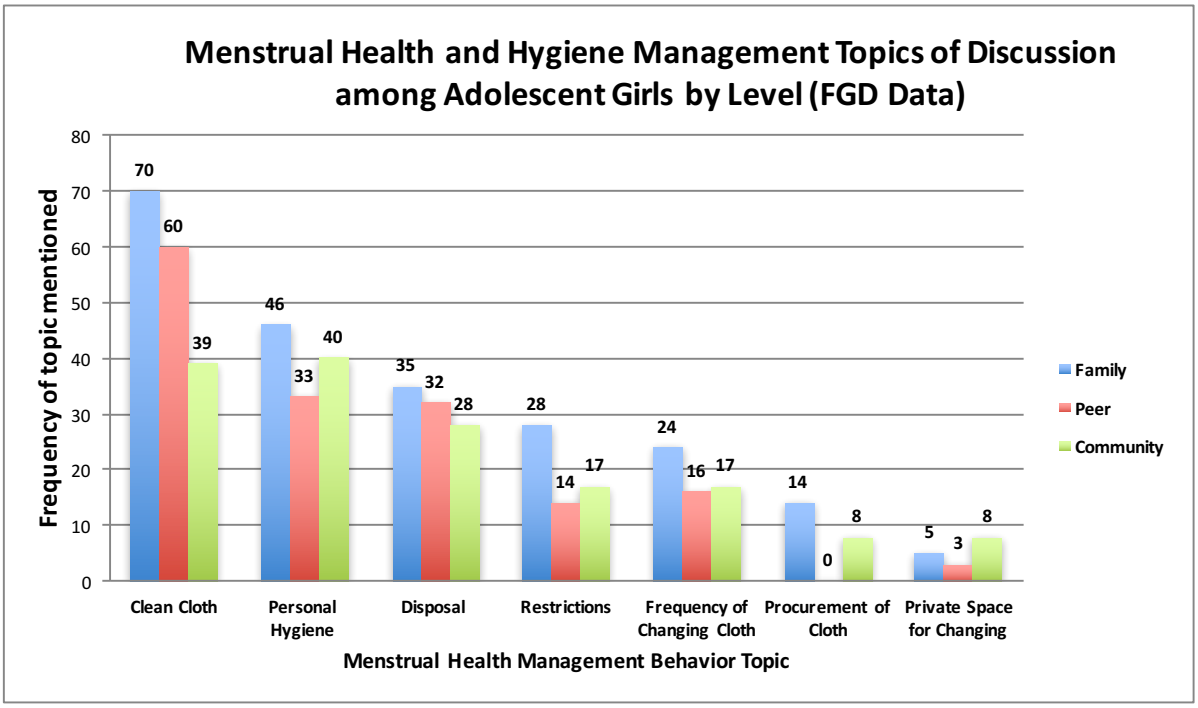
Discussion Related to Menstruation

Discussion related to menstruation was only measured using participatory social mapping in focus groups. As an element of FGD mapping, participants revealed prevalent topics of discussion about MHHM at each level of their map. The nature of participatory mapping allowed for measurement of complex data like discussion topics while participants explored interactions of their social network maps. The individual structured interviews did not provide the opportunity for respondents to reveal topics of discussion.

Qualitative analysis revealed that adolescent girls have more conversations regarding the use of clean absorbents than any other MHHM topic. Commonly described conversations related to clean absorbent use include the need to store one's absorbent in a clean and safe place, how to wash a menstrual cloth with soap and water, and how to dry a clean cloth in the sun to avoid bacterial growth. Following conversations related to clean absorbent use, girls report discussing personal hygiene, absorbent disposal, restrictions, frequency of absorbent change, procurement of absorbents, and private space for changing (see *Figure 3).*

For most topics, the majority of conversations happen at the family level, presumably among network contacts adolescent girls previously stated regularly engaging with, such as mothers, sisters, aunts, and bhabhis. At the peer and community level, the trends are less clear, however more conversations about absorbent procurement, the necessity for private changing space, and personal hygiene are more prevalent at the community level compared to the peer level. Because adolescent girls have described social contact with community health workers the most, these conversations are likely to be happening more among AWWs, ASHAs, and field facilitators.

Figure 3. Topics of Discussion Regarding MHHM



Social Networks and Menstrual Health and Hygiene Management Indicators

Structured interviews also provided information about MHHM indicators. The strength of network ties to adequate MHHM was measured by conducting correlation testing between girl's knowledge and behavior and the social network structure data. The nature of individual interviews and quantitative data allows for this comparison, something participatory social network mapping could not provide.

To identify the social network contacts that influence adequate MHHM behavior, a bivariate analysis using a chi-square Pearson correlation was employed. The dependent variables used were menstrual health knowledge and behavior indicators, found in *Table 7*. The dependent variables were dichotomized into adequate and inadequate menstrual health knowledge or behavior. The independent variables were the network contacts girls report talking to about menstruation. The results are presented as significant associations in *Table 7*.

Table 7. Correlations Between Social Network and MHHM Indicators

Correlation between Social Networks and MHHM Indicators										
	Family Level				**Peer Level**			**Community Level**		
MHHM Indicators	**Mother**	**Sister**	**Aunt**	**Bhabhi**	**School Friends**	**Neighbor**	**AGG friends**	**AWW**	**Field Facilitator**	**ASHA**
Correct Knowledge	50.4*	50.3	53.4*	49.4	51.2*	51.5	48.7	50.2	48.7	54.0*
Correct Storage	59.8	59.1	62.8	62.6	59.7	57.1	58.3	60.1	57.8	71.5*
New Cotton Cloth (use)	18.8	17.8	19.8	17.1	18.6	16.8	14.2	15.4*	16.7*	17.9
Disposal	96.5	96.2	97.5	98.2*	96.8	95.6	96.5	97.3	96.8	96.4
Medical Pain Management	32.6*	32.0	35.1*	36.3*	32.8	30.8	31.5	36.6*	31.3	36.2
Non-Medical Pain Management	70.4	70.1	70.3	71.3	72.4	68.8	70.3*	73.1*	72.5*	68.5
Significance determined at p<0.05										

The analysis identified mothers, aunts, school friends, and ASHAs to be significant influencers of correct menstrual health knowledge. ASHAs were the only predominant network contact that was significantly correlated with correct storage behavior. The use of new cotton cloth as a menstrual absorbent was only significantly correlated with the inclusion of field facilitators in the social networks of adolescent girls. Discussions with bhabhis were significantly correlated with disposal practices. And finally, non-medical pain management was correlated with mothers, aunts, bhabhis, and AWWs, while medical pain management was correlated with AWWs and field facilitators. The decision to include pain management as an MHHM behavior indicator was based on the high percent of discussion regarding pain symptoms revealed during FGD mapping.

Despite sisters and peers being predominant allies to communication related to menstruation, there are no significant correlations between network connection to sisters, neighbors, or AGG friends. This suggests that adolescent girls' social contact with older or more maternal females at the family level have more influence on adequate MHHM knowledge and behavior than peer contact. Additionally, community level health workers are significantly associated with multiple MHHM indicators suggesting that engagement at the community level with community health workers is crucial for translation of adequate MHHM practice.

Discussion

The onset of menstruation is an expected and important component of growing up. Despite being a natural and healthy process, conversations regarding the topic of menstruation are silenced in rural communities of India as they are a source of great shame and embarrassment (UNICEF, 2015). While most studies on menstrual health focus on access and availability of MHHM resources and individual menstrual health behaviors, this study recognizes negligible communication as the first barrier communities face in ensuring

adequate MHHM of adolescent girls by exploring social networks with both a structured quantitative and participatory qualitative data collection approach.

Quantitative vs Qualitative Data Collection

This study explored the intricacies of social network theory through the use of quantitative (structured interviews) and qualitative (FGDs) data collection tools. While both approaches have strengths and weaknesses, to answer the research questions presented in this study, both tools should be used in tandem.

The first question this study intended to measure was regarding trends in social network structure of adolescent girls regarding menstruation. While both instruments provided the same information, there are strengths and weaknesses associated with both. The greatest strength of the structured interview is ease of data collection and analysis. Adolescent girls were sampled to complete an individual interview by answering open ended questions. All that was required for analysis was translation and coding as the data was input into STATA for analysis. The dataset was ready for analysis one month after data collection. On the other hand, participatory maps were collected in the form of visual data which was hand written on large sheets of paper that were then translated, coded, and entered into STATA for analysis. Given the subjective nature of both qualitative coding and translation, it took multiple months of cross-checking and the use of very conservative coding to have a complete dataset for analysis five months after data collection.

The main difference noted between the structured interviews' and FGDs' data collection was the level of description available through participatory approaches. In structured interviews adolescent girls did not specify relationship as fully as they did in FGDs. Social network maps disaggregated aunts into four different types revealing the exact type of aunt they speak to most about menstruation, whereas the interviews did not. It appears that FGD and participatory dynamics allow adolescent girls to share more detailed descriptions of who they speak to at each level of the social network map. While this method may lead to over reporting, it would be recommended to gather more descriptive accounts of social network structure.

The second research question was regarding the MHHM discussion topics adolescent girls have among family, peer, and community levels. All the data gathered to answer this question came exclusively from the FGD social network maps. There were many strengths to the use of participatory mapping to gather this information. The first is that participatory mapping allows for empowerment of study respondents. They were able to talk openly about a taboo topic, revealing the type of conversations and messages they receive related to menstrual health. By hearing how their peers engage with others about menstruation it is an opportunity for participants to view themselves in context of what others do with regard to openly discussing menstruation.

Weaknesses associated with social network mapping include the difficulty in subjectively interpreting and coding complex written datasets. It is a time consuming process, but when done systematically and conservatively it can be used for analysis. Additionally, there is little control with instrumentation. FGD facilitators were trained to conduct social network mapping activities, but because the participants were given the opportunity to construct maps independently, the data collected could be highly variant. Finally, one last weakness of the participatory approach is the requirement of group consensus. Not all adolescent girls in a FGD have the same experience of communication regarding menstruation, but through joint mapping they are required to develop a map together. This eliminates the opportunity for measurement of unique variables individuals face in their social networks.

The third research question determined existing correlations between impersonal communication and MHHM knowledge and behavior of adolescent girls. Statistical correlations can only be found when individuals are asked both about networks and health behaviors. Because the interview included a section about MHHM knowledge and behavior, the interviews could be used to correlate social network structure with adequate MHHM at the individual level. This is a great strength of quantitative data collection because attributing correlation is a key element to social network theory and health behavior. Knowing that social networks have the ability to improve health outcomes through relationships and communication (Smith & Christakis, 2008), the correlation between network structure and MHHM indicators is necessary to advance menstrual health and plan community interventions.

In summary, interview approaches are efficient in both data collection and analysis. The structured interviews allowed for the ease of collection of large amounts of data through a structured guide. Data was collected for 1,050 adolescent girls, whereas data for the FGDs came from 105 groups, totaling to 871 participants. Additionally, interviews only took about an hour in length, whereas the FGD took twice the amount of time. Similar to the ease of quantitative data collection, the analysis is more efficient than with FGD data. Analysis for the FGDs was more complex because data came in the form of visuals (social network maps) which needed to be carefully translated first and then subjected to multiple rounds of coding. In comparison, the interview data only needed to be translated from Hindi to English and then transferred for analysis on a statistical package (STATA). Though gathering and analyzing quantitative data from structured interviews presented to be more efficient, qualitative data from the FGDs provided richer and more in-depth insight on participant responses. The capacity of research teams and individual settings must be carefully considered before employing one method over the other.

Intervention Implications

The study results indicate that individual exposure to key network contacts, such as mothers and community health workers, is associated with adequate MHHM knowledge and behavior. This suggests that MHHM interventions should focus on strategies that use key

influencers in addition to program materials and activities to reach adolescent girls. While this is the first study that we know of that identifies key networks influencers in relation to MHHM behaviors, our findings are consistent with previous finding that adolescent girls in India have the most discussion related to menstruation with their mothers (Clothe, et al., 2014) and justifies efforts to increase MHHM capacity of community health workers.

Adolescent girls receive the majority of their MHHM information from their mothers, so to ensure girls are properly prepared for menstruation, efforts should be made to improve knowledge and menstrual health behaviors of their mothers. Knowing that misconceptions regarding menstruation are prevalent in rural India and mothers may lack adequate knowledge to provide their daughters, (Clothe, et al., 2014) including them as intervention participants will deliver sustainable outcomes by means of primary prevention.

This study was able to correlate adequate MHHM knowledge and behavior to adolescent girls who included field facilitators and other community health workers in their social networks. And though adolescent girls mentioned peers to be strong allies of menstrual health communication, they were not found to be key influencers of adequate MHHM behaviors. Using adult women to transfer their experience and knowledge related to menstruation to adolescent girls is more advantageous than using peers. Adolescent health topics such as menstruation are new experiences for young people, so information is better received from trusted women who have lived experience rather than peers who are new to the matter as well.

Recommendations and Next Steps

The use of participatory research methods is an empowering process for respondents, but it is important to ensure comfort and safety for respondents when asking them to share personal experiences with taboo and stigmatized topics. The sampling frame used for participatory research in FGD settings must be homogenous. First this allows for a truer depiction of the population sampled, but it can also help eliminate bias related to social desirability as respondents may be more comfortable with their peers and able to share honestly rather than how they think others will perceive them.

Before employing participatory approaches to any research question, first it is important to consider the information the study is trying to collect. If the scope of the study includes exploring multifaceted health behaviors, perhaps using participatory approaches is appropriate. But if the study is trying to explain or attribute causality to behaviors at the population level then using traditional quantitative data collection approaches will be more beneficial. Additionally, if the story the study is trying to tell is simple and does not require participatory or collective community agreement, then strongly consider the amount time participatory tools require for implementation and analysis. This is especially true when working with translated data.

As the topic of MHHM quickly climbs the global population health agenda, additional measures to understand the role of interpersonal communication and dialogue on MHHM behavioral outcomes is necessary. While adolescent girls are the primary audience for most menstrual health interventions, this study shows that communication is happening at family, peer, and community levels. To further explain how and why social networks influence adequate MHHM knowledge, attitudes, and behaviors other key populations must be studied to validate the communication adolescent girls revealed in this study. If social networks are gathered from mothers, fathers, siblings, teachers, community health workers, etc. then a more descriptive portrayal of how communication and information regarding MHHM flows through the community can be explored to find key ties responsible for MHHM.

To fully understand the extent to which conversations about menstruation are silenced in rural India control villages without exposure to any menstrual health intervention must be sampled. Using social network mapping as a behavioral monitoring tool is useful in describing the flow of communication during and after and intervention to measure program related outcomes. But to better inform invention goals and activities related to improving negligible communication, social network mapping can be used during the formative evaluation and planning of program initiatives.

Limitations

This study had several limitations, the first being the unreliability of treatment implementation. Given the variant levels of campaign implementation across the three state sampling frame, adolescent girls' exposure to UNICEF's Menstrual Health Management program is asymmetrical. Second, irregular instrumentation was used to collect focus group discussion social network data across the different states. For example, maps collected in Uttar Pradesh revealed who girls turn to first and second at each level whereas the maps from Bihar and Jharkhand showed who girls turn to first and second from the entire network. Small differences in FGD facilitation may have changed the way data was provided and interpreted. Finally, this study has limited generalizability due to the use of purposive sampling. Adolescent girls who participated in structured interviews and FGDs were recruited from attendance rosters and a part of an MHHM intervention. Thus, the findings remain restricted to adolescent girls with similar sociodemographic characteristics and from communities with exposure to UNICEF's Menstrual Health Management intervention.

Conclusion

This study demonstrates that the use of participatory research tools, such as social network mapping, provides a descriptive analysis of social network dynamics including network structure and specific discussions happening about menstruation. However, through the use of structured interviews, MHHM knowledge and behavior can be correlated to network structure. These finding reinforce the value of utilizing participatory methods for data

collection, complementing interview approaches, to elucidate a comprehensive understanding of individual and community health behaviors. Finally, this study is able to conclude that interpersonal communication regarding menstruation with female family members and community health workers has positive MHHM outcomes for adolescent girls in rural India. So, don't let a period end a sentence, let it start a conversation!

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MANUSCRIPT 2: SOCIAL NORMS

"*Today's girls don't believe old ideas*": The relationship between approval and menstrual health behaviors among adolescent girls in rural India

Abstract

Background: The onset of menstruation is a developmental milestone, signaling the transition from girlhood into adolescence. Prevalent social norms regarding menstruation in India include dietary, mobility, and religious restrictions that stem from the notion than a woman is ritually unclean during menstruation. Studies explain that adolescent girls in rural India abide by menstruation related social norms simply because they are told to do so despite evidence linking poor menstrual health and hygiene management (MHHM) to adverse health. This study explores the extent to which socio-cultural norms and restrictions influence adolescent girls' menstrual health behaviors in order to better inform community-level menstrual health promotion.

Methods: A mixed method study was conducted to capture individual and community-level perceptions of menstrual health related social norms in Bihar, Jharkhand, and Uttar Pradesh. Post-menarche adolescent girls (n=871) were recruited to take part in 105 focus groups discussions and participate in the development of 2x2 tables to discuss social norms as a group. Mothers (n=210) and fathers (n=210) were recruited to be individually interviewed using the same questions posed to adolescent girls.

Results: Menstrual management behaviors, including drying and disposal of used menstrual absorbents, are approved of by 84.3% and 90.1% of the respondents sampled. While adequate disposal practices align with approval at 91.3%, there is a 7.4% difference between approval and behavior rates relating to drying. Respondents associated hygiene and preventing infection with adequate behavior, as well as social discrimination and embarrassment. Adolescent girls, frontline workers, and field facilitators have the lowest approval of restrictions regarding cooking and touching pickle, however 44.8% of mothers and 76.5% of fathers approve of such restrictions for traditional reasons. Additionally, 89.8% of adolescent girls approve of attending social gatherings during menstruation, but only 72.4% of mothers and 30.5% of fathers agree. Despite approval differences 94.8% of adolescent girls attend functions anyway.

Conclusion: Despite misconceptions related to menstrual blood and the prevalence of traditional MHHM practices, adolescent girls in Bihar, Jharkhand and Uttar Pradesh describe adequate absorbent drying and disposal behaviors and the rejection of restrictive social norms despite the approval of their parents.

Background

Introduction

The onset of menstruation is a developmental milestone and part of every healthy girl's transition into adolescence. For adolescent girls around the world menarche is accompanied with profound social significance, most often determined by community-level socio-cultural factors (Sommer, Hirsh, Nathanson, & Parker, 2015). Social stigma associated with menstruation in India is reinforced by the notion that menstrual blood is dirty and expelled from the body as a process of purification (Garg, Goyal, & Gupta, 2012; Kansal, Singh, & Kumar, 2016; Kirk & Sommer, 2006; Mahon & Fernandes, 2010). The common misconception that women are ritually impure during menstruation has resulted in deeply rooted taboos, and restrictions. (Garg, Sharma, & Gupta, 2012). Such myths and misconceptions regarding menstruation have resulted in the stigmatization of the topic and strict socio-cultural taboos and restrictions placed on adolescent girls, reinforcing gender inequity and poor menstrual health management (Juyal, Kandpal, Semwal, 2013; Garg, Goyal, & Gupta, 2012; Shankaraiah, Haveri, Mallappa, & Saheb, 2013).

The mere topic of menstruation is sensitive in India and consequently, communication between adolescents and adults is uncommon (Mahon & Fernandes, 2010). Poor communication sustains taboos and social restrictions, which generates and reciprocates social norms (UNICEF, 2015). Social norms surrounding menstruation include dietary, mobility, and religious restrictions (Kumar & Srivastava, 2011). Dietary related restrictions placed on menstruating women and adolescent girls include not entering the kitchen, and most commonly avoiding sour foods (Dasgupta & Sarkar, 2008; Farage, Miller, & Davis, 2011). Literature indicates that up to 61.3% of women experience restrictions related to touching preserved food, particularly pickle, during menstruation (Narayan, Srinivasa, Pelto, & Veerammal, 2001; Raina & Balodi, 2014; Rana, Prajapati, Sonaliya, Shah, Patel, Solanki, 2015; Thakre et al., 2011). Previous literature describes up to 59.3% of women and adolescent girls reporting mobility related restrictions that exclude them from social functions, weddings, family dinners, or playing outside (Farage, Miller, & Davis, 2011; Karkada, Jatanna, & Abraham, 2012; Paria & Das, 2014; Raina & Balodi, 2014; Shankaraiah, Haveri, Mallappa, & Saheb, 2013; Thakre et al., 2011). Religious restrictions include not entering religious places both at home and in the community. Literature on religious restrictions indicate that up to 70.6% of girls do not attend religious functions during menstruation (Dasgupta & Sarkar, 2008). Other mobility related restrictions include not attending school, playing outside, or leaving the home when menstruating. Restrictions during menstruation play a clear role in the lives of adolescent girls in rural India, yet many of them, including their mothers abide by restrictions to which they are unable to justify and explain. For example, a study in Jharkhand found that 76.9% of respondents abide by restrictions simply because they are told to do so and are unable to explain the purpose behind the restrictions they are following (Kumar & Srivastava, 2011).

Behavioral Consequences Resulting from Social Norms

Social and behavioral health science has long used social norms to explain how societal factors influence individual behavior within the context of a reference group or community (Mackie, Moneti, Shakya, & Denny 2015). Historically, social norms have been conceptualized as either *descriptive* or *injunctive*. A descriptive norm is the perception of what others are doing and then modeling one's behavior with regard to that perception (Ciadini & Trost, 1998). In contrast, an injunctive norm is the perception of what the majority of the reference groups approves or disapproves of and thus behaving in the way the majority thinks one should behave. Further conceptualizing social norms, Bicchieri (2006) defines a social norm based on normative and empirical expectations of 'enough other people.' Enough other people does not always have to be a reference group majority, but one's conformity to the norm is based on the belief that enough other people observe the norm in a given situation or that enough other people will positively or negatively sanction them based on one's choice to observe or violate the norm (Bicchieri, 2014).

Poor menstrual hygiene behaviors have resulted from social norms stigmatizing and restricting adolescent girls and women during menstruation. Unable to dry their clean cloth in the sun due to taboos regarding the sight of menstrual cloth, adolescent girls report using moist or damp cloth as absorbents during menstruation (Garg, Goyal, & Gupta, 2012). If a cloth is improperly dried it can promote bacterial growth, causing reproductive tract infections which cause devastating effects, such as toxic shock syndrome, cervical cancer, and infertility, if left untreated (Garg, Goyal, & Gupta, 2012). Dietary restrictions contribute to inadequate nutrition of adolescent girls, which may result in anemia and a low body mass index making them vulnerable to illness (Mohite et al, 2013). Finally, when mobility restrictions are imposed upon menarche it signals the beginning of new adult responsibilities, sometimes accompanied by early marriage, forcing girls to discontinue their education and social activities (Kirk & Sommer, 2006).

Connecting Perceptions of Social Norms to Menstrual Health Behaviors

To the best of our knowledge, the relationship between individual, parental, and community perceptions of social norms regarding menstruation and their consequential connection to menstrual health behavior has not been explored to date. The objective of this paper is two-fold. First this article aims to explore the connection between perceived socio-cultural norms and menstrual health behaviors. The second objective is to examine the extent in which rewards and sanctions associated with social norm approval and disapproval influence menstrual health behaviors among adolescent girls.

Given the socio-cultural context in which adolescent girls are managing their menstrual health, prevalent myths and misconceptions, and overall low knowledge regarding reproductive health in rural India we hypothesize that perceived individual and community

behavior expectations for compliance to social norms, restrictions, and taboos will significantly affect adolescent girls' conformity to social norms.

Methods

Study Design and Setting

Data for this manuscript comes from a mixed methods study using community-based structured interviews and focus group discussions to examine the effectiveness of a community based intervention across three states of India: Uttar Pradesh, Bihar, and Jharkhand. UNCEF's Communication Framework for Menstrual Management engages adolescent girls, mothers, fathers, and community members in a multi-media communication package about the importance of menstrual health and hygiene management (MHHM). Frontline workers and peer educators facilitate monthly meetings to provide adolescent girls with accurate awareness and knowledge to both reduce social stigma associated with menstruation and promote adequate MHHM behaviors. The social norms data gathered during concurrent behavioral monitoring measures the social domain by studying two variables, norms and restrictions, regarding menstrual health.

The results in this paper are from structured interviews and focus group discussions among key respondent groups during Phase 1 of the concurrent behavioral monitoring. Structured interviews were used to gather responses from mothers, fathers, frontline workers, and field facilitators while focus group discussions were used to gather responses from adolescent girls. Within Uttar Pradesh, 45 villages were chosen from the districts of Jaunpur, Mizapur, and Sonbhadra. In Bihar, 30 villages were chosen from the districts of Nalanda and Vaisahali. And in Jharkhand, 30 villages were chosen from the districts of Gumla and East Singhbum. Data collection occurred during October of 2015 over 4 weeks.

Participants

Seven districts were purposively selected for measurement if they were implementing UNICEF's Communication Framework for Menstrual Management, albeit at variant stages in Jharkhand, Bihar, and Uttar Pradesh. A complete list of intervention villages was created for each district and blocks were purposively selected to provide equal representation of local NGO partners in implementation. Random selection was then used to identify 15 villages from each district, finalizing the sample for this study.

After villages were selected using attendance rosters from Adolescent Girls' Group Meetings, a component of the intervention, field researchers contacted adolescent girls at their residence to recruit them to take part in the study. Mothers and fathers were recruited from the same households as adolescent girls. Frontline workers and field facilitators were recruited at the village Anganwadi Center.

In total, there were six types of respondents participating in the structured interviews. Within each district, the structured interview sample included 30 mothers (n=210), 30 fathers

(n=210), 15 frontline workers (n=104), and 10 field facilitators (n=68). Adolescent girls were the only respondent group that participated in the focus group discussions. Within each district 15 adolescent girls' focus group discussions were included in the sample (n=105). Adolescent girl participants were contacted at their residence and after obtaining parental consent or individual assent were selected to take part in the focus group. Mothers, fathers, frontline workers, and field facilitators all provided consent prior to interview participation. Drexel University's Institutional Review Board provided approval for data collection.

Data Collection

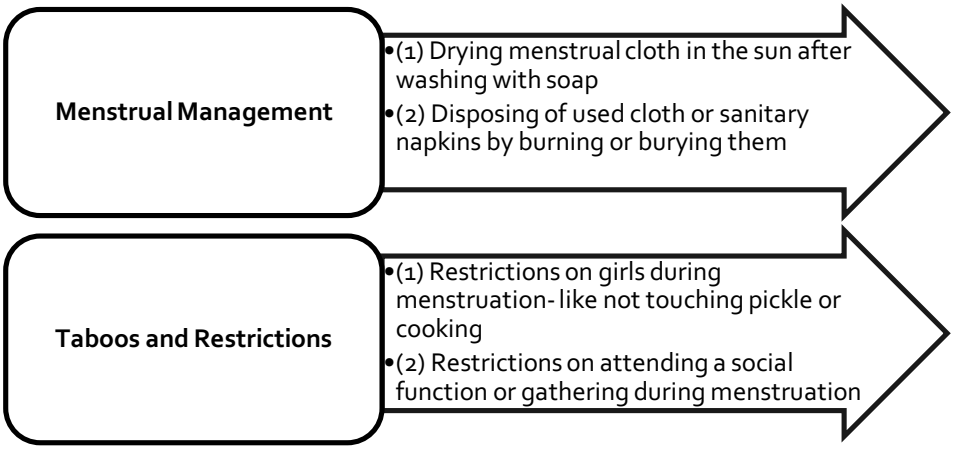
Trained interviewers, using a structured interview guide conducted in-depth interviews. The structured-interview guide consisted of pre-coded as well as open response questions including demographic data and information related to approval and disapproval of menstrual health behaviors, taboos, and restrictions. The interviews were translated from English into Hindi and held one-on-one in the participant's village, where they were recruited and lived. Interviews were conducted at the respondent's home or a private place convenient for the respondents and took between sixty to ninety minutes to complete.

Additionally, trained focus group facilitators used community-based participatory monitoring tools to facilitate focus group discussions among adolescent girls. The focus group discussions involved four data collection activities tailored for adolescent girls in rural India and lasted approximately two hours. Focus group discussion guides were translated from English to Hindi and facilitators participated in training prior to data collection to assure systematic and efficient focus group facilitation. Focus groups consisted of 8-12 adolescent girls and were held in a convenient place within the same village girls were recruited and lived.

Measures

Structured interview questions and 2x2 tables were used to measure social norms and their relationship to menstrual health behaviors, restrictions, and taboos. There were two menstrual management constructs measured and two taboo and restriction constructs, as seen in *Figure 1*. Menstrual management constructs included 1) Drying menstrual cloth in the sun after washing with soap and 2) Disposing of used cloth or sanitary napkins by burning or burying them. Taboo and Restriction behaviors included 1) Restrictions on girls during menstruation- like not touching pickle or cooking and 2) Restrictions on attending a social function or gathering during menstruation.

Figure 1. Menstrual Health Social Norms Constructs

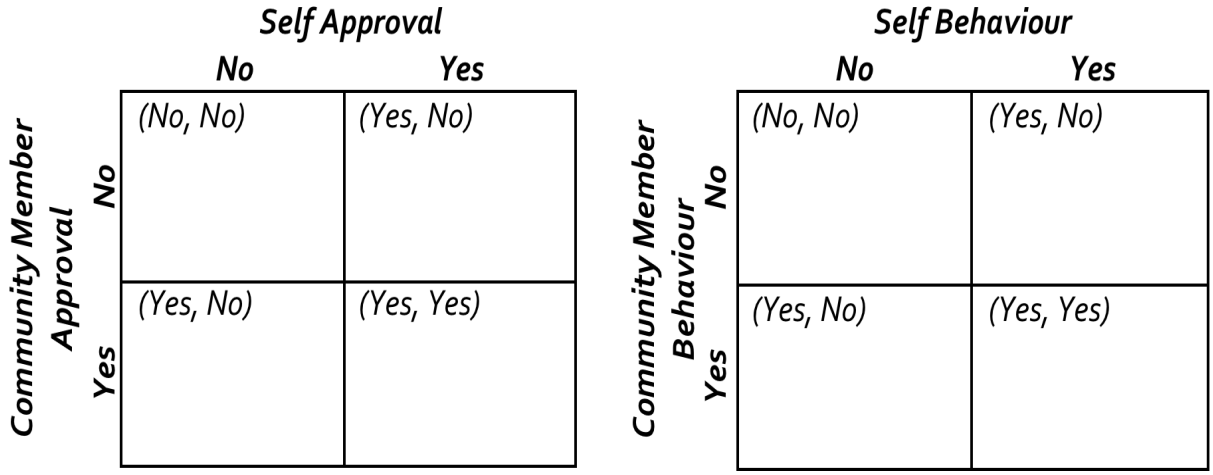


Structured interviews. The structured interview guide consisted of seven sections. For the purposes of this manuscript only, questions from the Social Norms section of the interview were analyzed. There were eight questions regarding each of the four menstrual health related social norms (i.e., drying, disposal, and restrictions-not touching pickle or cooking and attending social functions) in the interview, however not all respondent groups were asked every question. Frontline workers and field facilitators were excluded from questions regarding daughter behavior as they are not parents and only know the behavior of adolescent girls as a community. Additionally, fathers were not asked about menstrual management, and only asked about taboos restrictions, as they are not likely to be aware of adolescent girls' MHHM behavior but play a role in restricting girls during menstruation.

All four menstrual health social norms were explored using the same questions. First, two dichotomous questions (yes/no) were asked regarding individual and community approval and disapproval. Then, participants were asked to provide reasons for their answers. Again, participants were asked two dichotomous questions (yes/no) regarding their daughter's behavior and other adolescent girls of their community's behavior related to the menstrual health social norm. Finally, they were asked to provide the reasons, rewards, and punishments associated with their adolescent girls' behavior. The interview questions can be accessed in *Appendix B: Data Collection Tools for Social Norm analyses*.

Focus group discussions. Focus group discussions were designed using community-based participatory principles. The interactive tool used among adolescent girls in this study is called a 2x2 table, displayed in *Figure 2*. This tool allows for the visual comparison of two sets of information and the simplification of complex constructs, such as descriptive and injunctive social norms related to menstruation. Exploring social norms among a group of peers allows individuals to see themselves as innovators of menstrual health practice or conforming to prevalent norms. It also allows them to see the role of rewards and punishments in perpetuating social norms in their community.

Figure 2. 2x2 Tables for Social Norms



In the focus group discussions all four menstrual health social norms were explored using the same questions. The participants were asked to work through 2x2 tables comparing their self-approval and their community's approval of menstrual health norms and provide the reasons they place themselves in specific quadrants on the table. Then, reflecting on the same norm they were asked to compare their self-behavior to the behavior of other adolescent girls in their community and explain the rewards and punishments associated with the condition. All responses were collected on two large 2x2 tables so participants could visually participate in the activity and actively reflect on their individual response as well as the responses of their peers. The focus group discussion guide can be accessed in *Appendix B: Data Collection Tools for Social Norm analyses*.

Data Analysis

A mixed-method analysis plan was implemented to understand community-level social norms regarding menstruation. Structured interview and focus group discussion data were analyzed separately and then compared to explore community-level social norms.

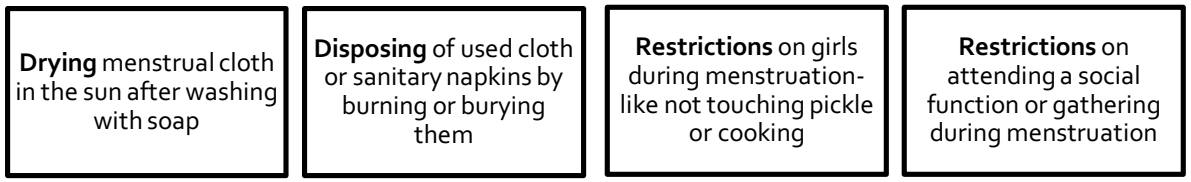
Quantitative Methods. Quantitative analyses described respondent's approval compared to their community's approval of social norms, as well as adolescent girl's behavior in comparison to other girls in the community. Data from the structured interview and focus group discussions were translated into English and entered into Stata 14.1 for analysis. Univariate analyses were conducted to understand basic response frequencies and percentages. Further, analyses were conducted to describe respondents' approval of MHHM, taboos, and restrictions in comparison to the community's approval. The same analyses were conducted to describe the adolescent girls' behavior in comparison to that of other girls in their community.

Qualitative Methods. Qualitative data regarding the reasons, rewards, and punishments associated with menstrual health social norms in the structured interview and focus group discussions were translated into English, coded, and entered in Stata 14.1. Data analysis began with the development of primary codes to capture all responses revealed by respondent groups. Codes were then collapsed to represent salient themes and the three most prevalent themes were reported to describe reasons, rewards, and punishments participants associate with MHHM, taboos, and restrictions social norms.

Results

The study findings are organized to describe social norms by comparing the results of all respondent groups. The intent is to explain the relationship between individual approval and behavior regarding menstrual management, restrictions, and social norms and identify emergent themes in the reasons, rewards, and punishments associated with the norm. The four social norms explored are displayed below in *Figure 3*. Results are presented separately for each of the four social norms that were explored by respondents. Their responses are categorized according to the quadrant of the 2x2 table (see *Figure 2*) they identify with during the interview or FGD.

Figure 3. Menstrual Health and Hygiene Social Norms



Drying Menstrual Cloth in the Sun after Washing with Soap

Approval and behavior. The practice of drying one's cloth in the sun after washing with soap is a requirement for adequate MHHM if one is washing and reusing cotton cloth as a menstrual absorbent. Of the adolescent girls sampled, 83.4% say they personally approve and their community approves of drying menstrual cloth in the sun. *Table 1* below shows that across all respondent groups there was little variation between personal approval and community approval of adolescent girls drying menstrual cloth in the sun. Across all respondent groups there is an 84.3% self and community approval rate. In contrast, 6.6% of respondents state their personal disapproval and their community's disapproval of drying menstrual cloth in the sun after washing.

Similar trends between personal behavior and community behavior related to drying menstrual cloth in the sun are observed across respondent groups. Overall, 77.4% of

adolescent girls and 74.8% of mothers say they or their daughter dries her menstrual cloth in the sun as do other girls in their community. However, there is a 7.4% difference between approval and behavior at the community level. This indicates that while 84.3% of people approve of drying a menstrual cloth in the sun, 7.4% fewer adolescent girls are comfortable actually practicing even though they approve of it.

Table 1. Comparison of Personal and Community Drying Approval and Behavior Across Respondents

Menstrual Management: Drying of Menstrual Cloth												
	Approval						Behaviors					
Respondents	**AG**	**M**	**F**	**FLW**	**FF**	**Total**	**AG**	**M**	**F**	**FLW**	**FF**	**Total**
N	**871**	**210**		**104**	**68**	**1253**	**871**	**210**				**1081**
Yes/Yes	83.4	83.3		81.7	89.7	84.3	77.4	74.8				76.9
Yes/No	8.4	5.2		15.4	10.3	8.5	5.5	5.7				5.6
No /Yes	1.3	2.4		0.0	0.0	1.3	4.3	7.6				4.9
No/No	7.0	9.1		2.9	0.0	6.6	12.9	11.9				12.7

Reasons for approval and disapproval. The top 3 reasons adults associate with approval and disapproval of drying menstrual cloth in the sun are displayed in *Table 2.* The most common reasons associated with personal and community approval are that it prevents germs, infection, and illness followed by the removal of stain and odor. When adults approve of drying despite their community's disapproval, their reasons surround the idea that menstruation is considered impure and their community avoids the practice. The only reasons given when adults disapprove of the drying practices is that it is a repelling sight or that reusing cloth is not a correct practice.

The reasons adults associate with proper dying practices of their daughter and girls of their community behavior that it prevents germs and illness and it sanitizes their cloth and prevents odor. Common reasons for those who do not dry menstrual cloth are related to personal embarrassment of drying menstrual cloth in front of their elders or simply because they do not reuse menstrual cloth.

Table 2. Reasons Reported by Adults for Drying Approval and Drying Behavior of Adolescent Girls

Adult Reasons: Drying of Menstrual Cloth			
		Approval	**Behaviors**
Yes/Yes	**Reason 1**	*Prevents germs*	*Prevents germs and illness*
	Reason 2	*Fear of getting infection and illness*	*It sanitizes cloth and prevents odor*
	Reason 3	*Removes stains/odor*	*It saves cloth*
Yes/No	**Reason1**	*Community finds it wrong and impure*	*My daughter does it to kill germs, but others are embarrassed in front of elders*
	Reason 2	*It can be reused if dried in sun, but my community shies away from it*	*My daughter does it to save cloth, but community girls don't reuse cloth*
	Reason 3	*I think it prevents illness, but community finds menstruation impure*	--
No /Yes	**Reason1**	*No response*	*My daughter doesn't reuse cloth, but community girls do*
	Reason 2	--	*My daughter is embarrassed to dry in front of elder, but others are not embarrassed*
	Reason 3	--	
No/No	**Reason 1**	*It is a repelling sight*	*They don't reuse the same cloth*
	Reason 2	*Reusing the same cloth is not correct*	*They are embarrassed to dry in front of elders*
	Reason 3	--	--

Reasons adolescent girls provide regarding approval related to the practice of drying menstrual cloth in the sun closely mirror that of adults in their community as seen in *Table 3.* Common reasons provided when they disapprove of drying their cloth are strongly related to feelings of embarrassment and shame. They are afraid somebody, specifically village elders or men will see their cloth.

Table 3. Reasons Reported by Adolescent Girls on Drying Approval

Adolescent Girl Reasons: Drying		
		Approval
Yes/Yes	**Reason 1**	*Kills and prevents germs*
	Reason 2	*Prevents infection*
	Reason 3	*Prevents bad odor and foul smell*
Yes/No	**Reason 1**	*I approve as it kills germs*
	Reason 2	*It dries completely and prevents disease*
	Reason 3	*I am aware through books and ASHA meetings*
No /Yes	**Reason 1**	*I am uncomfortable washing menstrual cloth*
	Reason 2	*I am afraid somebody may see*
	Reason 3	*I do not reuse cloth, but community may reuse cloth*
No/No	**Reason 1**	*Hidden from sight so elders and men won't see*
	Reason 2	*Causes embarrassment, it's considered shameful*
	Reason 3	*Cloth is not reused*

Rewards and punishments associated with drying of menstrual cloth. Adults described rewards and punishments associated with drying menstrual cloth in the sun. The common rewards and punishments mentioned are displayed in *Table 4.* The rewards relate to adequate dying and the prevention of germs, stains, and infection. They also stated that with proper drying girls are able to use perfectly dried cloths. Most respondents said there are no punishments associated with drying, but some mentioned the potential of illness and societal discrimination.

Table 4. Rewards and Punishments Reported by Adults for Drying of Menstrual Cloth

Adults Rewards and Punishments Associated with Drying		
	Rewards	**Punishments**
Reason 1	*Prevents germ build-up and infection*	*No punishments*
Reason 2	*Prevents germs and removes stains*	*Illness*
Reason 3	*Prevents illness and results in perfectly died cloths*	*Societal discrimination*

Adolescent girls revealed the rewards and punishments they associate with their personal behavior and their perception of other girls' behavior. The majority (77.4%) of girls who said they and their community dries menstrual cloth in the sun, the most common reward was prevention of disease and illness, while for punishments, 'nothing' was commonly reported, as seen in *Table 5.* Of the 12.9% of girls who say they do not dry their cloths in the sun and neither do other girls in their community the rewards included were protection from embarrassment and avoidance of hard work.

Table 5. Rewards and Punishments Reported by Adolescent Girls for Drying of Menstrual Cloth

Adult Rewards and Punishments Associated with Drying			
		Rewards	**Punishments**
Yes/Yes	1	*Prevents disease/illness*	*Nothing*
	2	*Kills germs/prevents germs*	*Fear of illness*
	3	*Helps people stay healthy*	*Embarrassment if people see*
Yes/No	1	*Prevents disease/illness*	*Is shameful and causes embarrassment*
	2	*Prevents infection*	*Time consuming*
	3	*Prevents bad odor/foul smell*	*Scolding from elders*
No /Yes	1	*Can reuse/saves cloth*	*Nothing*
	2	*Prevents disease/illness*	*Fear of illness*
	3	*Prevents infection*	*Causes disease*
No/No	1	*Saves from embarrassment*	*Causes embarrassment*
	2	*Cloth is not reused*	*Time consuming*
	3	*Avoid hard work of cleaning*	*Fear of witchcraft*

Disposing of Used Absorbent by Burning or Burying

Approval and behavior. Disposal of used menstrual absorbents by burning or burying is a behavior associated with menstrual management. Among the participants sampled 90.1% of them personally approve and say their community approves of proper disposal of absorbents seen in *Table 6.* Similarly, 91.3% of the sample say either they or their daughter disposes of absorbents properly and so do other girls from their community.

A difference between the perceived behavior among adolescent girls and their mothers is observed. Only 1.8% of adolescent girls say they do not adequately dispose of absorbents and neither do other girls in their community, while 12.4% of mothers say their daughter does not dispose of her absorbent by burning or burning and neither do girls in the community.

Table 6. Comparison of Personal and Community Disposal Approval and Behavior Across Respondents

Menstrual Management: Disposal of Menstrual Cloth												
	Approval						Behaviors					
Respondents	**AG**	**M**	**F**	**FLW**	**FF**	**Total**	**AG**	**M**	**F**	**FLW**	**FF**	**Total**
N	**871**	**210**		**104**	**68**	**1253**	**871**	**210**				**1081**
Yes/Yes	91.0	88.1		86.5	91.2	90.1	93.0	84.8				91.3
Yes/No	7.0	4.8		11.5	8.8	7.1	4.9	2.4				4.4
No /Yes	0.1	0.0		0.0	0.0	0.0	0.2	0.8				0.3
No/No	2.0	7.1		1.9	0.0	2.7	1.8	12.4				3.9

Reasons for approval and behavior. Reasons adults use to describe their approval and perceived behavior of adolescent girls are seen in *Table 7.* The most common reasons for approval include preventing dirt and illness, keeping the environment clean, and being aware of the benefits of disposal. Common reasons for disapproving of disposal by burning or burying are that it will make girls infertile and it is a shameful thing to do.

Reasons adults associate with correct menstrual absorbent disposal behavior include preventing pollution, the absorbent cannot be seen, and it prevents the spread of illness. Reasons for incorrect behavior include girls being used to throwing used absorbent in the pond and girls are superstitious.

Table 7. Reasons Reported by Adults for Disposal Approval and Behavior

Adult Reasons: Disposal			
		Approval	**Behaviors**
Yes/Yes	**Reason 1**	*Prevents spread of dirt and illness*	*Prevents pollution*
	Reason 2	*Best way of disposing absorbents*	*Cannot be seen*
	Reason 3	*Keeps environment clean*	*Prevents spread of illness*
Yes/No	**Reason1**	*I am aware of benefits, but community isn't sensitized*	*My daughter does it to prevent pollution, but community girls are not aware*
	Reason 2	*I approve, but community believes it will result in infertility*	*My daughter does it because it's the best method, but community girls are not aware*
	Reason 3	--	--
No /Yes	**Reason1**	*No responses*	*Girls know it's the correct way of disposal*
	Reason 2	--	*Girls do not due to superstitions*
	Reason 3	--	*My daughter believes it can cause infertility, but community girls do not believe that*
No/No	**Reason 1**	*It will makes girls infertile and our lineage won't survive*	*Girls are used to throwing it in the pond where they bathe*
	Reason 2	*It is a shameful thing to do*	*Girls don't do it because of superstition*
	Reason 3	--	--

Adolescent girls' reasons for approval mirror those of adults in their communities as seen in *Table 8.* Reasons for proper disposal include preventing littering, preventing the spread of disease, and keeping absorbents hidden from sight. Reasons for disapproval of burning or burying are the potential for infertility, carrying absorbents out for disposal is embarrassing, and black magic.

Table 8. Reasons Reported by Adolescent Girls for Disposal Approval and Behavior

Adolescent Girl Approval Reasons: Disposal		
Yes/Yes	**Reason 1**	*Prevents littering*
	Reason 2	*Prevents spreading of diseases*
	Reason 3	*Hidden from sight*
Yes/No	**Reason 1**	*Prevents littering, hidden from sight*
	Reason 2	*Prevents pollution and littering*
	Reason 3	*Hidden from sight*
No /Yes	**Reason 1**	*It would come out while farming*
	Reason 2	--
	Reason 3	--
No/No	**Reason 1**	*Burning causes infertility*
	Reason 2	*It is embarrassing to carry to dispose*
	Reason 3	*Black magic*

Rewards and punishments associated with burning and burying of menstrual cloth. Adults and adolescent girls provide similar rewards and punishments associated with the disposal of used absorbents by burning or burying them, seen in *Table 9.* The rewards associated with proper disposal embrace ideas of protecting the environment by preventing litter and pollution. The punishment commonly associated with burning absorbents is the threat of infertility or black magic. Of the 1.8% of adolescent girls who do not properly dispose of used absorbents and say their community does not either, they were mostly unable to think of any rewards or punishments associated with their behavior.

Table 9. Rewards and Punishments Reported by Adults for Disposal of Menstrual Cloth

Adult Rewards and Punishments Associated with Disposal Behavior		
	Rewards	**Punishments**
Reason 1	*Prevents pollution*	*Nothing*
Reason 2	*Protect from illness*	*Pollutes*
Reason 3	*Keeps the environment clean*	*Burning causes infertility*

Table 10. Rewards and Punishments Reported by Adolescent Girls for Disposal of Menstrual Cloth

Adolescent Girl Rewards and Punishments Associated with Disposal Behavior			
		Rewards	**Punishments**
Yes/Yes	1	*Prevents spreading of diseases*	*Burning causes infertility*
	2	*Prevents littering*	*Black magic*
	3	*Prevents pollution*	*Burying outside might cause conflict*
Yes/No	1	*Prevents spreading of diseases*	*Burning causes infertility*
	2	*Hidden from sight*	*Burning causes pollution*
	3	*Prevents littering*	*Burying outside might cause conflict*
No /Yes	1	*Prevents embarrassment*	*Nothing*
	2	*Nothing*	--
	3	--	--
No/No	1	*Nothing*	*Nothing*
	2	*Prevents spreading diseases*	--
	3	*Stray animals will not litter it*	--

Placing Restrictions on Girls During Menstruation- Not Touching Pickle or Cooking

Approval and behavior. During menstruation adolescent girls face restrictions on their daily lives. The distribution of approval and disapproval between adolescent girls and their mothers and fathers is vast. *Table 11* shows 36.9% of adolescent girls say they approve and their community approves of placing restrictions on girls during menstruation. However, a higher percentage of mothers (41.8%) and of fathers (76.5%) approve of these restrictions. A much lower percentage (22-26%) of village health workers, compared to other respondent groups, personally approve of restrictions and say their community approves too.

The variant levels of personal and community approval of placing restrictions on girls during menstruation continue as similar trends are seen for behavior. Forty-four percent of adolescent girls say they follow restrictions, as do other girls in the community. Over half of mothers and fathers say their daughters and community girls follow restrictions. Interestingly, 27.1% of sampled fathers could not say if their daughter or girls in their community abided by restrictions or not.

Table 11. Comparison of Personal and Community Restrictions (Not touching pickle or cooking) Approval and Behavior Across Respondents

Menstrual Management: Restrictions (Not touching pickle or cooking)												
	Approval						**Behaviors**					
Respondents	**AG**	**M**	**F**	**FLW**	**FF**	**Total**	**AG**	**M**	**F**	**FLW**	**FF**	**Total**
N	**871**	**210**	**210**	**104**	**68**	**1463**	**871**	**210**	**210**			**1291**
Yes/Yes	36.9	44.8	76.5	26.0	22.1	40.6	44.2	50.5	54.3			46.9
Yes/No	2.6	4.3	1.1	5.8	5.9	3.0	4.6	3.8	0.0			3.7
No /Yes	32.3	5.2	2.2	15.4	16.2	22.1	21.6	5.2	0.5			15.7
No/No	28.2	45.7	20.1	52.9	55.9	32.2	29.6	48.5	18.1			29.5
Can't Say	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.1			4.4

Reasons for approval and behavior. Reasons for approval of restrictions and behavior related to restrictions by adults is depicted in *Table 12.* The reasons associated with approval are closely mirrored by the reasons for behavior. The most common reasons adults mention for restrictions is that menstruation is impure and imposing restrictions is an old traditional belief. They believe if menstruating girls touch pickle it may rot and that eating sour foods will cause increased bleeding, making dietary restrictions warranted. The most common reason for opposing restrictions is being aware that menstruation is natural and not believing old age ideas. They say, "today's girls don't believe old ideas."

Table 12. Reasons Reported by Adults for Restrictions (Not touching pickle or cooking) Approval and Behavior of Adolescent Girls

Adult Reasons: Restrictions, Restrictions (Not touching pickle or cooking)			
		Approval	**Behaviors**
Yes/Yes	**Reason 1**	*It's an old belief, menstruation is impure*	*Pickles rot if touched*
	Reason 2	*Pickles will rot*	*Menstruation is impure, It is a traditional practice*
	Reason 3	*Sour foods cause increased bleeding*	*Sour foods cause trouble during menstruation*
Yes/No	**Reason 1**	*It's an old belief, community does not follow but I do*	*Pickles rot if touched, but community don't believe*
	Reason 2	*Sour foods cause increased bleeding*	*Menstruation is impure, we practice traditional practices but community doesn't*
	Reason 3	--	--
No /Yes	**Reason 1**	*I don't because it's wrong, but community does*	*We don't believe in superstitions but community does*
	Reason 2	*Menstruation is normal, but community thinks impure*	*Community thinks pickles will rot*
	Reason 3	*Today's girls don't believe old ideas, but community does*	*Community follows restrictions as they have been practiced for ages*
No/No	**Reason 1**	*We are aware and don't believe restrictions*	*We are aware and beliefs have changed*
	Reason 2	*Menstruation is not considered wrong, people are educated now*	*Don't believe superstitions*
	Reason 3	*Nothing happens*	*Don't follow restrictions*

The main reason adolescent girls provide for approving of restriction is that they believe in taboos, believe menstrual blood is impure, and believe worshipping during menstruation will pollute the temple as seen in *Table 13.* The most common reason among adolescent girls for not following restrictions is that they tested such restrictions and nothing happened. They say they don't believe in old customs and are educated and aware about menstruation now.

Table 13. Reasons Reported by Adolescent Girls for Restrictions (Not touching pickle or cooking) Approval and Behavior

Adolescent Girl Reasons: Restrictions (Not touching pickle or cooking		
Yes/Yes	**Reason 1**	*Believe in taboos*
	Reason 2	*Menstrual blood is impure*
	Reason 3	*Worshipping during menstruation will pollute the temple*
Yes/No	**Reason 1**	*I approve because my family approves, but my community doesn't approve*
	Reason 2	--
	Reason 3	--
No/Yes	**Reason 1**	*I don't believe menstruation is impure, but my community believes it is impure.*
	Reason 2	*I believe it is natural, but community believes in old customs*
	Reason 3	*Nothing spoils, but community*
No/No	**Reason 1**	*Tried and tested*
	Reason 2	*Not orthodox, we do not believe in old customs*
	Reason 3	*We are educated and aware*

Rewards and punishments associated with restrictions-like not touching pickle or cooking. Adults listed rewards and punishments they associate with restrictions. The three most common responses are displayed in *Table 14*. Most commonly adults were unable to think of any rewards associated with restrictions followed by preserving pickles and trees and being able to relax. Common punishments again included nothing, pickles being spoiled as the body is impure, and feeling tension.

Table 14. Rewards and Punishments Reported by Adults for Restrictions-like not touching pickle or cooking

Adults Rewards and Punishments Associated with Restrictions (Not touching pickle or cooking)		
	Rewards	**Punishments**
Reason 1	*Nothing*	*Nothing*
Reason 2	*Pickles and trees don't get damaged*	*Pickles get spoiled as the body is impure*
Reason 3	*You can relax*	*Tension/feeling bad*

Adolescent girls expressed the rewards and punishments they associate with their personal behavior regarding restrictions depicted in *Table 15.* For girls who experience restrictions the common rewards are that things will not spoil, god will be happy, and they will not be scolded. In comparison, girls who do not experience restrictions say their rewards are that they can eat whatever they want, can act according to their personal wishes, and they feel empowered to do anything during menstruation.

Table 15. Rewards and Punishments Reported by Adolescent Girls for Restrictions-like not touching pickle or cooking

Adolescent Girls - Rewards and Punishments Associated with Restrictions (Not touching pickle or cooking)			
		Rewards	**Punishments**
Yes/Yes	1	*Things will not spoil*	*Pickle will spoil, plants will die, eggs won't hatch*
	2	*God will be happy*	*Can't worship and will miss religious occasions*
	3	*Don't get scolded*	*Cooking will not be done*
Yes/No	1	*Things will not spoil*	*Nothing*
	2	*Nothing*	*Can't worship and will miss religious occasions*
	3	*Can't eat whatever I want to eat*	*Pickle will spoil, plants will die, eggs won't hatch*
No /Yes	1	*Can't eat whatever they want to eat*	*Nothing*
	2	*Can according however one likes*	*Scolding/beating/Fear of scolding*
	3	*Feels empowered to do anything during menstruation*	*Pickle will spoil, plants will die, eggs won't hatch* *Can't worship and will miss religious occasions*
No/No	1	*Can eat whatever they want to eat*	*Scolding/beating/Fear of scolding*
	2	*Can act according to one's wish/freedom*	*Might cause disease*
	3	*Feel empowered to do anything during menstruation*	*Pickle will spoil, plants will die, eggs won't hatch*

Attending a social function or gathering during menstruation

Approval and behavior. During menstruation attending a social function is traditionally restricted. *Table 16* shows the distribution of respondent groups who personally approve and disapprove of attending a social function during menstruation in comparison to their community's approval. The difference between adolescent girls', mothers', and fathers' approval and disapproval of attending social functions during menstruation is vast. Of the girls, 89.8% personally approve and believe their community approves of attending social functions during menstruation while 72.4% of their mothers and only 30.5% of their fathers agree. Findings show a similar trend in disapproval. Three percent of adolescent girls, 21.9% of their mothers, and 52.9% of fathers disapprove and believe their community disapproves of girls attending social functions during menstruation.

These trends are similar when comparing individual behavior with the behavior of other adolescent girls in the community. Almost all the adolescent girls attend social functions during menstruation and believe others in their communities do as well. However, 73.8% of mothers and 35.7% of fathers agree. Interestingly, 29.1% of fathers were unable to say if their daughters or other girls in their community attend social functions during menstruation.

Table 16. Comparison of Personal and Community Restrictions (Attending social gatherings) Approval and Behavior Across Respondents

Menstrual Management: Restriction - Attending social functions during menstruation												
	Approval						Behaviors					
Respondents	**AG**	**M**	**F**	**FLW**	**FF**	**Total**	**AG**	**M**	**F**	**FLW**	**FF**	**Total**
N	**871**	**210**	**210**	**104**	**68**	**1463**	**871**	**210**	**210**			**1291**
Yes/Yes	89.8	72.4	30.5	72.1	83.8	77.2	94.8	73.8	35.7			80.9
Yes/No	6.5	4.3	16.7	13.5	10.3	8.3	2.1	2.4	1.4			1.9
No /Yes	0.2	1.4	0.0	0.0	0.0	0.3	0.3	1.9	0.0			0.0
No/No	3.4	21.9	52.9	14.4	5.9	14.1	2.8	21.9	33.8			10.9
Can't Say	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.1			4.7

Reasons for approval and behavior. Reasons adults describe for approval of attending social functions during menstruation include not having restrictions related to attending social function, that most people are aware now about menstruation, and believing that menstruation is a natural process as seen in *Table 17.* Reasons they disapprove of attending a social function are that menstruation is still considered impure, that adolescent girls do not want to go, and that one cannot wear new clothes during menstruation.

Table 17. Reasons Reported by Adults on Restrictions (Attending social gatherings) Approval and Behavior

Adult Reasons: Attending Social Gatherings			
		Approval	**Behaviors**
Yes/Yes	**Reason 1**	*No restrictions in attending social functions*	*There is awareness that menstruation is not a disease*
	Reason 2	*Most people are aware now*	*Girls are happy to go out and meet people*
	Reason 3	*Menstruation is a natural process*	*There is no difficulty*
Yes/No	**Reason 1**	*I believe menstruation is natural, but community believes it is impure*	*Girls are happy to go out and meet people, but community doesn't allow*
	Reason 2	--	*We allow, but community doesn't as cloths get ruined*
	Reason 3	--	*We allow, but community thinks it's impure*
No /Yes	**Reason 1**	*Can't wear new clothes, but community may*	*We don't as new clothes get ruined, but community doesn't mind*
	Reason 2	--	*We don't as it is impure, but community does*
	Reason 3	--	*We don't but community does as it's an opportunity to meet people*
No/No	**Reason 1**	*Menstruation is still considered impure*	*Menstruation is considered impure*
	Reason 2	*Don't want to go*	*New clothes get ruined and scared of embarrassment*
	Reason 3	*Can't wear new clothes*	*Girls say they don't want to go*

The reasons adults think adolescent girls attended social functions during menstruation are because there is awareness now that menstruation is not a disease, that girls are happy when they go out, and that there is no difficulty in managing menstruation at social functions. Reasons adults think adolescents do not attend social functions during menstruation are that menstruation is considered impure, that new clothes may get ruined and they are scared of embarrassment, and that girls do not want to go to events during menstruation.

Adolescent girls revealed different reasons for their approval and disapproval in comparison to adults in their communities, displayed in *Table 18.* The most common reason among of adolescent girls who approve of attending social functions (89.9%) is because they want to enjoy good food, dance, sing, wear new clothes and be happy. They want to socialize and say they are well prepared to manage menstruation at events.

The reasons provided by the 3.4% of adolescent girls who disapprove and believe their community disapproves of attending social functions during menstruation are because they follow old age customs, there is pain and discomfort during menstruation, and that it is sinful to attend.

Table 18. Reasons Reported by Adolescent Girls for Restrictions (Attending social gatherings) Approval and Behavior

Adolescent Girl Reasons: Attending Social Gatherings		
		Approval
Yes/Yes	**Reason 1**	*Enjoy good food, dance, sing, new clothes, be happy*
	Reason 2	*Socialize*
	Reason 3	*Well prepared to manage menstruation*
Yes/No	**Reason 1**	*I approve as menstruation is natural*
	Reason 2	*I approve as I am educated*
	Reason 3	*I approved and am well prepared*
No /Yes	**Reason 1**	*I don't go because I feel uncomfortable, but others go*
	Reason 2	*I don't go, but community says go and sit in the corner*
	Reason 3	--
No/No	**Reason 1**	*We follow old age customs*
	Reason 2	*Pain and discomfort, unease, tension, anxiety*
	Reason 3	*Attending is sinful*

Rewards and punishments associated with restrictions-attending social gatherings. Adults provided rewards and punishments faced by adolescent girls who attend social functions during menstruation seen in *Table 19*. Most adults were unable to think of a rewards or punishments associated with attending social functions however the second most common reward is getting to have good food, meet with people, wear new clothes, dance, and have fun. Some said girls will have relief from their tension and anxiety. Some people mentioned girls

could feel upset or have more of a chance of bleeding or having a stomach ache as common punishments.

Table 19. Rewards and Punishments Reported by Adults for Restrictions (Attending social gatherings)

Adult Rewards and Punishments Associated with Attending Social Gatherings		
	Rewards	**Punishments**
Reason 1	*Nothing*	*Nothing*
Reason 2	*Get to get good food/meet people/wear new clothes/dance and enjoy*	*Feel upset*
Reason 3	*Relief from tension and anxiety*	*More chance of bleeding or stomach ache*

Adolescent girls discussed rewards and punishments associated with their personal experience regarding attending social functions or not attending social functions in comparison to others in their community. Common rewards girls associated were attending social gatherings include enjoying good food, dancing, singing, wearing new clothes, and being happy seen in *Table 20.* They said they enjoy socializing and getting gifts at functions. Punishments they associate with attending include the potential of staining, experiencing pain and discomfort, and a fear of getting sick or feeling weak.

On the other hand, adolescent girls who do not attend social functions consider missing school and getting rest as rewards. Punishments still include the potential for staining and missing out on the occasion and the experience of fun.

Table 20. Rewards and Punishments Reported by Adolescent Girls for Restrictions (Attending social gatherings)

Adolescent Girls Rewards and Punishments Associated with Attending Social Gatherings			
		Rewards	**Punishments**
Yes/Yes	1	*Enjoy good food, dance, sing, new clothes, be happy*	*Can have staining*
	2	*Socialize*	*Pain and discomfort, unease, tension, anxiety*
	3	*Get gifts*	*Fear of falling sick/weakness*
Yes/No	1	*Enjoy good food, dance, sing, new clothes, be happy*	*Can have staining*
	2	*Socialize*	*Having problems changing absorbent*
	3	--	*Miss the occasion and the fun*
No /Yes	1	*Nothing*	--
	2	*Well prepared to manage menstruation*	*Miss the occasion and the fun*
	3	--	*Can't enjoy*
No/No	1	*Will miss school*	*Can have staining*
	2	*Get to rest*	*Nothing*
	3	--	*Miss the occasion and the fun*

Discussion

Socio-cultural restrictions and norms experienced by post-menarche adolescent girls in rural India present barriers to practicing adequate MHHM behaviors which can have negative health impacts. This study measured how norms related to menstrual management and taboos and restrictions are perceived by adolescent girls, mothers, fathers, frontline workers, and field facilitators through the use of *2x2 tables*, an innovative tool used to simplify complex social constructs and measure social norms.

Methodological Use of 2X2 Tables for Social Norms

To simplify complex constructs, 2X2 tables are used to compare two independent variables. Measuring injunctive and descriptive social norms, the two variables are the individual's approval or behavior in comparison to a reference group's approval or behavior. This study not only explores how menstrual management and restriction and taboo topics are normative in rural India but it describes how to measure social norms using 2X2 tables, an innovative measure developed for this study and used in both interview and FGD settings.

Adolescent girls were asked to construct 2X2 tables during FGDs where they explored all four questions as a group, whereas mothers, fathers, frontline workers, and field facilitators answered individually during private interviews. While the FGDs included a participatory element in which girls explored their self and community approval among peers, the discussion of a sensitive topic in a group may impact the data quality. Social desirability is likely, perhaps revealing biased results if the participants answer as they think is acceptable among their peers. On the other hand, the participatory nature of creating 2X2 tables in a FGD allows participants to compare the role of reasons, rewards, and punishments they associate with social norms with those of their peers. This allows participants to better understand and explain how norms are perpetuated in their community while empowering them to both talk about a sensitive issue and discuss their personal experiences and ideas.

Mothers, fathers, frontline workers, and field facilitators were asked about their personal approval, the approval of their community, and their daughter's behavior in relation to other girls in their community during structured interviews rather than FGDs. By asking social norm questions in a structured interview the threat of social desirability can be diminished, however respondents are not given the opportunity to explore their ideas, reasons, rewards, and punishments with peers, an element of learning and empowerment. Unlike FGDs, interviews had no element of visual data. Both the interviewer and the respondent must remember previous answers when giving their reasons, rewards, and punishments associated with their prior responses.

Implication of Social Norms

Through the measurement of social norms that impact MHHM behaviors of adolescent girls in rural India, both menstrual management and restriction and taboo related norms were assessed using four prevalent socio-cultural norms developed from literature.

Menstrual Management. The menstrual management norms measured include drying of a used menstrual cloth in the sun after washing it with soap, and disposing used menstrual management material by burning or burying it. When comparing approval and behavior associated with drying and disposal practices a strong majority all respondent groups sampled agree that they approve of and others in their community approve of them as well. When mothers and daughters were asked about drying and disposing menstrual absorbents the majority agree the practice is done by most adolescent girls. There is a small difference between drying approval and drying practice, but the difference between adolescent girls is only 6.0% and mothers is 8.5%. For the most part, the approval and behavior quadrants the respondents identified with were the same for both questions. This may suggest for menstrual management behaviors, such as drying and disposal, individuals have the autonomy to make behave according to their own will instead of social norms.

Taking into account the differences among respondent groups, adolescent girls have the highest approval rating between all respondent groups except field facilitators, suggesting girls are aware of adequate MHHM behaviors and practice them. The results show field facilitators having the highest approval of adequate drying and disposal, which is encouraging as they are responsible for the implementation of the UNICEF Menstrual Management Framework in sampled villages.

The rewards and punishments associated with menstrual management strongly mirror each other. Adult and adolescent girls associate adequate drying and disposing of menstrual management materials with preventing disease and illness. They reiterate that such practices help keep people healthy and are good for the environment. The rewards respondents associate with menstrual management suggest that the population is aware of the health risks of poor MHHM and know important health behaviors, such as drying and disposing used menstrual management material. Common punishments suggest forms of societal discrimination or the misconception that burning menstrual absorbents result in infertility. This suggests that the greatest reason individuals do not use adequate MHHM behaviors is due to fear of society. While the majority of adolescent girls have adequate MHHM behaviors, fear of social retribution deters them the most from participation. This suggests community level social norms interventions are needed to promote MHHM behaviors without fear of discrimination from the community.

Restrictions and Taboos. The restrictions and taboos measured for normative behavior in this study include adolescent girls entering the kitchen or touching pickle and girls attending social functions during menstruation. When asked if one should impose restrictions on adolescent girls like not entering the kitchen or touching pickle, fewer adolescent girls and

mothers approved of such restrictions in comparison to practicing the restrictions. Fathers on the other hand strongly approved of restrictions, but results show many fathers were unable to say if adolescent girls practiced restrictions during menstruation. Because adolescent girls tend to disapprove of restrictions but practice them anyway, this study suggests restrictions are normative expectations of adolescent girls. On the contrary, when asked about attending social functions during menstruation adults revealed high disapproval rates, yet 94.8% of girls report attending anyway. This result suggests girls do not adhere to normative expectations regarding mobility restrictions during menstruation.

The most striking difference between respondents' approval of restrictions and taboos is between adolescent girls and their fathers. Mothers tend to be more disapproving of restrictions and taboos than girls, but fathers and adolescent girls vary the most. Despite this difference, in regard to attending social functions, girls do not feel inclined to abide by their father's approval. Meanwhile, in relation to restrictions, such as not entering the kitchen or touching pickle, girls' attitudes are more variant and are consequently more likely to adhere to the restrictive attitudes of their parents, accepting restrictions rather than acting based upon their personal approval.

Overwhelmingly, the reasons and rewards adolescent girls reveal about attending social functions during menstruation is that they want to enjoy themselves and socialize with others. Punishments are associated with pain and fear of staining, but not about any social expectations or norms. However, rewards and punishments regarding entering the kitchen or touching pickle are more variant. Many girls say they have tested these restrictions and nothing has happened, while others say not entering the kitchen or touching pickle preserves food and makes god happy. Girls who do not adhere to restrictions say they feel empowered to do anything during menstruation, but also have a fear of being scolded or beaten for not abiding by social restrictions. These differences further suggest that some restrictions are influenced by societal expectations, while others are influenced by one's own autonomy. Understanding the reasons, rewards, and punishments regarding each norm should be understood before accrediting social norms as guiding MHHM behavior.

Additionally, it should be noted that the most common reward and punishment adults associated with both attending social functions and imposing restrictions on girls during menstruation was "nothing." This suggests that because adults cannot think of rewards or punishments that result from adherence to social norms, they are imposing them without justification. They approve of traditional menstrual management behaviors but usually cannot think of outcomes, either positive or negative, of the tradition. This complements Kumar and Srivastava's (2011) finding that 76.9% of women in Jharkhand abide by restrictions, but are unable to explain the reasoning for them. Drawing individual and community's attention to the the disconnect between approving of a social norm and being able to explain it may be an important application element for interventions using social norm approaches.

Using Social Norms Approaches for MHHM Intervention

This study suggests that social norms approaches can be used to address MHHM at the population level due to the dissonance between approval and behavior noted between adolescent girls, mothers, fathers, frontline workers, and field facilitators. It is clear that different respondent groups, most notably adolescent girls and their parents have different ideas regarding approval of norms and actual behavior during menstruation. Interventions should prioritize parents, especially fathers, to bring awareness to the reality that their daughter's do not approve or behave according to traditionally accepted menstruation related restrictions and taboos. Health communication programs in rural India can highlight that adolescent girls don't adhere to socio-cultural norms, have learned to manage their menstruation, and don't adhere to strict restrictions.

Limitations

This study had several limitations, the first being the possibility of reactivity to the experimental situation. In FGDs participants may feel inclined to answer in the way they expect their peers or the focus group facilitator to approve of instead of portraying their reality. A similar pressure may have been perceived by mothers, fathers, frontline workers, and field facilitators during structured interviews. Instrumentation was a limitation of the study as data was gathered using different tools for each of the six respondent groups. Additionally, this study has limited generalizability due to its use of purposive sampling. The findings remain restricted to communities with exposure to UNICEF's Menstrual Health Management intervention in Northern India.

Conclusion

Social norms related to menstruation in rural India have longstanding socio-cultural significance. While strict MHHM related restrictions are prevalent they do not always have negative behavioral impacts on adolescent girls. This study finds the majority of adolescent girls in Bihar, Jharkhand, and Uttar Pradesh describe correct absorbent drying and disposal behaviors and the rejection of restrictive social norms. Adolescent girl's approval and associated behaviors related to social norms varies most between that of their fathers. While parents have more restrictive views on menstruation related social norms than their daughters, adolescent girls tend to reject traditional restrictions, favoring their awareness and attitude that menstruation is natural, and not a source of shame.

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SKILLS AND LESSONS LEARNED

Throughout my CBMP experience I have achieved public health practice and research competencies through the analysis of participatory behavioral monitoring tools. To conclude this thesis, I would like to highlight key skills and lessons learned during this experience.

At the start of my Drexel education I was coming off a project in which I was working as a monitoring and evaluation assistant tasked with collecting qualitative data through key informant interviews and focus group discussions. Even with the Director's greatest intent to include this data in monitoring reports, the process of analysis and dissemination was too daunting for a small team hesitant to discuss qualitative findings. Knowing first-hand the programmatic value of those interviews and focus group discussions, I was discouraged to discover I would be one of the only people who heard detailed accounts of the program's strengths and weaknesses as well as initial behavioral outcomes of participants- but I too didn't know how to approach such data efficiently.

My prior experience made me doubt the practical use of mixed methods and participatory research for the soul reason of efficiency and resources. Now, I am walking away from my CBMP with a complete appreciation for the value of participatory data collection and the importance of incorporating qualitative findings even in process evaluation. Through the application and analysis of participatory and qualitative research principles, this experience allowed me to rethink data collection and analysis. Not only are the participatory behavioral monitoring tools used with adolescent girls in rural India empowering, but when systematically used to collect the community's perspective they greatly enhance the monitoring process both at the individual and community level. I will be able to take this new perspective with me and apply it to future projects.

This perspective did not come without multiple lessons learned along the way. First, I quickly learned that in the role of a technical support team member at an academic institution there are very different challenges than when working in the field. While instruments are designed to be clearly implemented the realities of data collection sometimes prohibit the control of instrumentation. For example, we expected 105 social network maps to be completed in the same way across all 3 states during the monitoring process. Instead, given the participants and their variant levels of exposure to the topic of menstruation, and the use of multiple focus group facilitators, we had 105 maps that depicted the right information yet were clearly collected in an asymmetrical pattern. While that is something we would have liked to control for analysis, field realities make instrumentation a challenge.

Another obvious, yet important lesson I learned was how to work with translated data. The importance of conservative coding schemes and cross-checking is imperative to ensure data quality before data analysis begins. While issues of translation may always be present, at the end of the day when working with qualitative data in which you have no working

proficiency you must to trust your team members and be patient as cross-checking and coding is a tedious process.

While I continue to question the current push for participatory research methods, this project has given me the opportunity to critically think about visual and narrative research tools as an asset for individual and community empowerment. As a result of this project I do think participatory research, while less economical, is a worthwhile investment in the community and I will apply skills I have learned to future projects when appropriate.

In addition to these lessons learned, the Association of Schools and Programs of Public Health (ASPPH) has detailed public health competencies for every student of public health. Of the cross-cutting competencies, *Table 1* presents the ways in which my CBMP has helped me realize certain proficiencies.

Table 1. ASPPH Public Health Competencies addressed by the CBMP

Communication	The ability to organize data to produce meaning and demonstrate effective written and oral communication skills with different audiences through the dissemination of work in poster, oral, and written presentations.
Program Planning	The ability to plan evaluation strategies and differentiate between qualitative and quantitative methodologies in relation to their strengths and limitations and appropriate uses.
Professionalism	Appreciate the importance of working collaboratively with local and international research partners.
Diversity and Culture	Ability to think through and develop public health strategies that are responsive to cultural values and traditions of communities and populations being served.

I look forward to applying the lessons and competencies gained over the last year working on this CBMP to my future projects and work. This CBMP helped merge key concepts gathered from the Department of Community Health and Prevention coursework with real world public health practice. I am thankful for the opportunity to leave the Dornsife School of Public Health a better community health researcher than when I walked in two years ago.

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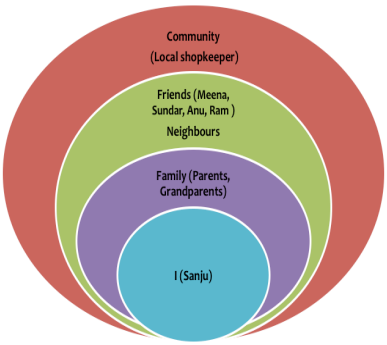
APPENDIX A: DATA COLLECTION TOOLS FOR SOCIAL NETWORK MAP ANALYSES

Focus Group Discussion Guide - Adolescent Girls: Social Network Maps



1. **First, take a couple minutes and think about who you all talk to about menstruation?**

   - Who in your family do you talk to about menstruation? What do you talk about?
   - Do you talk to your peers? Tell me the relation of the people you talk to about menstruation?

   If not given, ask for the name of teacher, AWW, ASHA.

   - Other people in the community?
   - What about teachers?
   - ASHAs and AWWs? What do you talk about?
   - Now tell me one by one, the specific things you talk with people about menstruation?

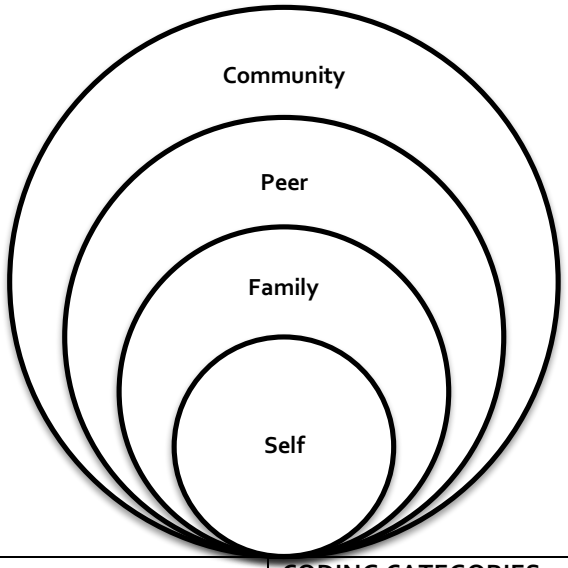
2. Now tell me who are the people with whom you are not comfortable talking to? (CIRCLE IN GREEN)

3. Who are the people in each group you are not comfortable talking to? (CIRCLE IN RED)

4. From all the individuals mentioned name one whom you turn to first to talk to? Who do you talk to if that person is unavailable?

5. Apart from individuals, what are some other sources of information about menstruation? (Radio, TV, social media)

Structure Interview Guide - Adolescent Girls: Social Network Maps

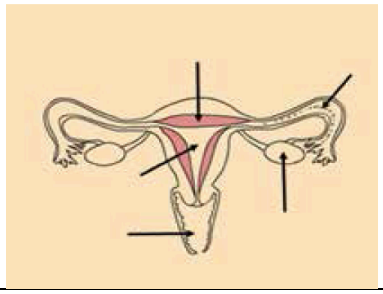


Q. NO	QUESTION	CODING CATEGORIES	
601	Please look at this map and tell me who you talk to about menstruation in the family?		
602	Please look at this map and tell me who you talk to about menstruation among your peers?		
603	Please look at this map and tell me who you talk to about menstruation among community members?		
604	Who are your allies/friends and who serve as barriers on the topic of menstruation? *Record on table*		
		Allies (People you are comfortable talking to)	**Barriers (People you are uncomfortable talking to)**

A	Family				
B	Peers				
C	Community Members				
605	From all the individuals mentioned name one whom you turn **to first to talk to?**				
606	Who do you talk to if that person is unavailable?				
607	Apart from people you talk to, where else do you get information about menstruation?			Radio	1
				TV	2
				Mobile phone	3
				Books	4
				Posters	5
				Street Play	6
				Nautanki	7
				Wall Painting	8
				AWC	9
				Film	10
				Newspaper/Magazine	11
				Any Other, specify _____	

Structured Interview Guide - Adolescent Girls: MHHM Knowledge

Q. NO	QUESTION	CODING CATEGORIES	
506	Can you show us in the map where menstrual blood originates?	Able to show	1
		Hesitated	2

		Take time to answer	3
		Did not know	4

Structured Interview Guide - Adolescent Girls: MHHM Behavior			
Q. NO	**QUESTION**	**CODING CATEGORIES**	
509	What type of menstruation absorbent do you use? **Multiple response**	New cotton cloth	1
		Old cotton cloth	2
		Any other synthetic cloth	3
		Sanitary Napkin/Pad	4
		Any other, specify_____	

511	How do you dispose of your used absorbent? **Multiple response**	Bury it in the soil in the field	1
		Throw it in the bush	2
		Burn the absorbent	3
		Hide under a stone	4
		Store and then take it to the school toilet incinerator	5
		Dustbin	6
		Pit	7
		Pond water body	8
		Any other, specify_____	

512	How do you manage pain and discomfort during menstruation?	Take a pain killer	1
		Take hot compress	2

	Multiple response	Drink warm liquid	3
		Bathe in warm water	4
		Rest for a while	5
		Meditate	6
		Take iron rich food	7
		Do light Exercise	8
		Go to ANM/ Doctor	9
		Go to ASHA/AWW	10
		Quack/Traditional Healer	11
		No Pain	12
		Do nothing	77
		Any other, specify_____	

513	How do you store your absorbent? **Multiple response**	Store the cloth in a hidden or concealed place	1
		Store the washed menstrual cloth along with other clothes of daily wear	2
		Store pad in a hidden place	3
		Do not store	4
		Store in safe and clean place	5
		Any others, specify _____	

APPENDIX B: DATA COLLECTION TOOLS FOR SOCIAL NORMS ANALYSES

Focus Group Discussion Guide - Adolescent Girls: 2X2 Tables for Social Norms

In this activity, we will complete two 2x2 tables using input from you for various menstrual health behaviours.

Community Member Approval	Self Approval: No	Self Approval: Yes
No	(No, No) Reasons:	(Yes, No) Reasons:
Yes	(No, Yes) Reasons:	(Yes, Yes) Reasons:

Community Member Behaviour	Self Behaviour: No	Self Behaviour: Yes
No	(No, No) Reasons: Rewards: Sanctions:	(Yes, No) Reasons: Rewards: Sanctions:
Yes	(No, Yes) Reasons: Rewards: Sanctions:	(Yes, Yes) Reasons: Rewards: Sanctions:

We are going to ask you if you approve or disapprove of specific menstrual health behaviour and then compare that to whether the community approves or disapproves of this same behaviour. We will do this for two specific issues

For every question mark the responses in the correct squares.
Count the responses beginning from the majority response and ask reasons for the responses.

2. Approval Disapproval of Menstrual behaviors

- ✓ Do you approve or disapprove of girls "drying menstrual cloth in the sun after washing with soap"?
- ✓ Do you believe that others in your community approve or disapprove of girls "drying menstrual cloth in the sun" after washing with soap?
- ✓ Do you approve or disapprove of "Disposing of used cloth or sanitary napkins by burning or burying them"?
- ✓ Do you believe that others in the community approve or disapprove of "Disposing of used cloth or sanitary napkins by burning or burying them"?

3. Taboos/Restrictions

- ✓ Do you approve or disapprove of 'imposing restriction on girls during menstruation- like not touching pickle or cooking'?
- ✓ Do you believe that others in the community approve or disapprove of 'imposing restriction on girls during menstruation-like not touching pickle or cooking'?
- ✓ Do you approve or disapprove of girls 'attending a social function or gathering during menstruation'?
- ✓ Do you believe that others in the community approve or disapprove of girls 'attending a social function or gathering during menstruation'?

.....

For the second part of this activity we are going to ask you to think about the same behaviours we've already talked about, but this time we are interested in knowing if you have personally performed or believe others in the community have performed the behaviour.

For every behaviour mark the responses in the correct squares:
Count the responses beginning from the majority response and write the rewards and punishments for each response.

4. Menstrual Health Behaviours

- ✓ Have you daughter 'dried the menstrual cloth in the sun after washing with soap?
- ✓ Do you believe that others in the community have 'dried the menstrual cloth in the sun after washing with soap'?
- ✓ Have you "burned or buried used clothes or sanitary pads"?
- ✓ Do you believe that other girls in your community have "burned or buried used clothes or sanitary pads"?

5. Taboos-Restrictions

- ✓ Do you follow restrictions during menstruation- like not touching pickle or cooking'?
- ✓ Do other girls in the community follow restrictions during menstruation-like not touching pickle or cooking'?
- ✓ What are some of the rewards of following restrictions during menstruation- like not touching pickle or cooking'?
- ✓ What are some of the punishments following restrictions during menstruation- like not touching pickle or cooking'?
- ✓ Have you 'attended social functions or gatherings in the community during menstruation'?
- ✓ Do you believe that other girls in the community have 'attended social functions or gatherings in the community during menstruation"?
- ✓ What are some of the rewards attending social functions or gatherings in the community during menstruation"?
- ✓ What are some of the punishments attending social functions or gatherings in the community during menstruation"?

Structured Interview Guide - Parents: 2X2 Tables for Social Norms			
Q.NO	**QUESTIONS AND FILTER**	**CODING CATEGORIES**	
701	**APPROVAL DISAPPROVAL OF MENSTRUAL BEHAVIORS (MOTHERS ONLY)**		
A	Do you approve or disapprove of girls "drying menstrual cloth in the sun after washing with soap"?	Approve	1
		Disapprove	2
B	Do you believe that others in your community approve or disapprove of girls "drying menstrual cloth in the sun" after washing with soap?	Approve	1
		Disapprove	2
C	You mentioned that you _____ but your community _____. Can you tell me the reason for your answer?		
D	Do you approve or disapprove of "Disposing of used cloth or sanitary napkins by burning or burying them"?	Approve	1
		Disapprove	2
E	Do you believe that others in the community approve or disapprove of "Disposing of used cloth or sanitary napkins by burning or burying them"?	Approve	1
		Disapprove	2
F	You mentioned that you _____ but your community _____. Can you tell me the reason for your answer?		
702	**MENSTRUAL BEHAVIORS- ACTUAL BEHAVIORS**		
A	Has your daughter 'dried the menstrual cloth in the sun after washing with soap?	Yes	1
		No	2
		Uses sanitary pad	3
B	Do you believe that others in the community have 'dried the menstrual cloth in the sun after washing with soap'?	Yes	1
		No	2
C	You mentioned that your daughter_____ but girls in your community _____. Can you tell me the reason for your answer?		

D	What are some of the rewards of drying menstrual cloth in the sun after washing with soap?	

E	What are some of the punishments associated with drying menstrual cloth in the sun after washing with soap?		
F	Has your daughter "burned or buried used clothes or sanitary pads"?	Yes	1
		No	2
G	Do you believe that other girls in your community have "burned or buried used clothes or sanitary pads"?	Yes	1
		No	2
H	You mentioned that your daughter_____ but girls in your community _____. Can you tell me the reason for your answer?		
I	What are some of the rewards of burning or burying used clothes or sanitary pads?		
J	What are some of the punishments associated with burning or burying used clothes or sanitary pads?		
703	**TABOOS AND RESTRICTIONS (BOTH MOTHERS & FATHERS)**		
A	Do you approve or disapprove of 'imposing restriction on girls during menstruation-like not touching pickle or cooking'?	Approve	1
		Disapprove	2
B	Do you believe that others in the community approve or disapprove of 'imposing restriction on girls during menstruation-like not touching pickle or cooking'?	Approve	1
		Disapprove	2
C	You mentioned that you _____ but your community _____. Can you tell me the reason for your answer?		

D	Do you approve or disapprove of girls 'attending a social function or gathering during menstruation'	Approve	1
		Disapprove	2
E	Do you believe that others in the community approve or disapprove of girls 'attending a social function or gathering during menstruation'?	Approve	1
		Disapprove	2
F	You mentioned that you _____ but your community _____. Can you tell me the reason for your answer?		
704	**TABOOS AND RESTRICTIONS- ACTUAL BEHAVIORS**		
A	Does your daughter follow restrictions during menstruation- like not touching pickle or cooking'?	Yes	1
		No	2
B	Do other girls in the community follow restrictions during menstruation-like not touching pickle or cooking'?	Yes	1
		No	2
C	You mentioned that your daughter _____ but girls in your community _____. Can you tell me the reason for your answer?		
D	What are some of the rewards of following restrictions during menstruation- like not touching pickle or cooking'?		
E	What are some of the punishments following restrictions during menstruation- like not touching pickle or cooking'?		

F	Has your daughter 'attended social functions or gatherings in the community during menstruation'?	Yes	1
		No	2
G	Do you believe that other girls in the community have 'attended social functions or gatherings in the community during menstruation"?	Yes	1
		No	2
H	You mentioned that your daughter_____ but girls in your community _____. Can you tell me the reason for your answer?		
I	What are some of the rewards attending social functions or gatherings in the community during menstruation"?		

J	What are some of the punishments attending social functions or gatherings in the community during menstruation"?	

Structured Interview Guide - FF and FLWs: 2X2 Tables for Social Norms			
Q.NO	**QUESTIONS AND FILTER**	**CODING CATEGORIES**	
701	**APPROVAL DISAPPROVAL OF MENSTRUAL BEHAVIORS**		
A	Do you approve or disapprove of girls "drying menstrual cloth in the sun after washing with soap"?	Approve	1
		Disapprove	2
B	Do you believe that others in your community approve or disapprove of girls "drying menstrual cloth in the sun" after washing with soap?	Approve	1
		Disapprove	2
C	You mentioned that you_____ but your community _____. Can you tell me the reason for your answer?		
D	Do you approve or disapprove of "Disposing of used cloth or sanitary napkins by burning or burying them"?	Approve	1
		Disapprove	2
E	Do you believe that others in the community approve or disapprove of "Disposing of used cloth or sanitary napkins by burning or burying them"?	Approve	1
		Disapprove	2
F	You mentioned that you_____ but your community _____. Can you tell me the reason for your answer?		
702	**ACTUAL BEHAVIOURS**		
A	Do adolescent girls in your community 'dry their menstrual cloth in the sun after washing with soap?	Yes	1
		No	2

C	Can you tell me the reason for your answer?	

D	What are some of the rewards of drying menstrual cloth in the sun after washing with soap?		
E	What are some of the punishments associated with drying menstrual cloth in the sun after washing with soap?		
F	Do adolescent girls in your community "burned or buried used clothes or sanitary pads?	Yes	1
		No	2
H	Can you tell me the reason for your answer?		
I	What are some of the rewards of burning or burying used clothes or sanitary pads?		
J	What are some of the punishments associated with burning or burying used clothes or sanitary pads?		
703	**TABOOS AND RESTRICTIONS**		
A	Do you approve or disapprove of 'imposing restriction on girls during menstruation-like not touching pickle or cooking'?	Approve	1
		Disapprove	2
B	Do you believe that others in the community approve or disapprove of 'imposing restriction on girls during menstruation-like not touching pickle or cooking'?	Approve	1
		Disapprove	2
C	You mentioned that you _____ but your community _____. Can you tell me the reason for your answer?		

D	Do you approve or disapprove of girls 'attending a social function or gathering during menstruation'?	Approve	1
		Disapprove	2
E	Do you believe that others in the community approve or disapprove of girls 'attending a social function or gathering during menstruation'?	Approve	1
		Disapprove	2
F	You mentioned that you _____ but your community _____. Can you tell me the reason for your answer?		

704	Do adolescent girls in your community follow restrictions during menstruation- like not touching pickle or cooking'?	Yes	1
		No	2
705-706			
714	Can you tell me the reason for your answer?		
707	What are some of the rewards of following restrictions during menstruation- like not touching pickle or cooking'?		
708	What are some of the punishments following restrictions during menstruation- like not touching pickle or cooking'?		
709	Do adolescent girls in your community 'attend social functions or gatherings in the community during menstruation'?	Yes	1
		No	2
711			
715	Can you tell me the reason for your answer?		
712	What are some of the rewards for attending social functions or gatherings in the community during menstruation"?		
713	What are some of the punishments for attending social functions or gatherings in the community during menstruation"?		